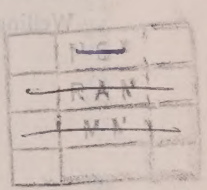
REPORT

OF THE

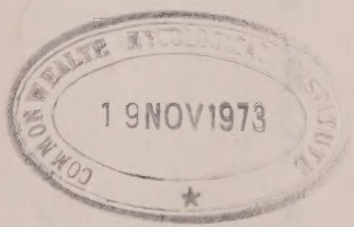
DIRECTOR-GENERAL OF FORESTS

FOR THE YEAR ENDED

31 MARCH 1973



Presented to the House of Representatives
Pursuant to Section 68 of the Forests Act 1949



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THE DIRECTOR-GENERAL OF FORESTS

to the Hon. C. J. Moyle, Minister of Forests

Wellington, 5 July 1973.

SIR,

I have the honour to present, pursuant to section 68 of the Forests Act 1949, the annual report of the operations of the New Zealand Forest Service for the year ended 31 March 1973.

I have, etc.,

A. P. THOMSON, Director-General of Forests.

Hon. C. J. MOYLE,
Minister of Forests,
Wellington.

CONTENTS

	PAGE
STATISTICAL SUMMARY—IMPERIAL MEASURE	5
STATISTICAL SUMMARY—METRIC MEASURE	6
FOREST POLICY AND FORESTRY HIGHLIGHTS	
The Forests of New Zealand	7
Progress in Afforestation	9
Management of Indigenous Forests	9
Regional Development through Forestry	12
Management of Mountain Lands	13
Noxious Animals Control	14
New Wood-based Industry	15
Timber Supplies for House Building	15
Commercial Division Policy	16
PRODUCTION FORESTRY	
Management	17
Silvicultural Operations	18
Extension Forestry	20
Fire Control	21
PRODUCTION, CONSUMPTION, AND TRADE	
Total Wood Production	22
Sawn Timber Production	22
Forest Service Production and Sales	23
Pulp and Paper	24
Panel Products	24
Commercial Division Operations	24
External Trade	26
Unfavourable Exchange Rate Adjustments	27
RESEARCH AND DEVELOPMENT	
Research	28
Metrication	30
Wood Use	30
Timber Preservation Authority	32
Engineering Developments	32
ENVIRONMENTAL FORESTRY	
Classification of Forests	34
Recreational Developments	34
Surveys of Catchments	35
Forest Sanctuaries	35
Noxious Animals	35
OTHER ACTIVITIES	
Training	37
Staff Ceiling	37
Overseas Visits	37
External Aid	38
Computer Services	39

PAGE

APPENDICES

1. Area of State Forest Land 40
2. New Area Planted 40
3. Establishment and Clear Felling 41
4. Pruning and Thinning 45
5. Protection Forestry—Principal Regions under Control .. 46
6. Total Timber Removals—Indigenous and Exotic State Forests 46
7. Total Smallwood Removals from State Forests 47
8. Total Timber Removals from State Indigenous Forests—By Method of Sale 48
9. Total Timber Removals from State Exotic Forests—By Method of Sale 49
10. Removals of Exotic Roundwood from State Forests—Thinnings and Clear Fellings 50
11. Forest Service Sawmills—Production and Sales .. 51
12. Produce Treated by Forest Service 52
13. Employment and Training 53
14. Commercial Division Accounts 55
15. Forest Service Accounts 60
16. Production of Sawn Timber 62
17. Production of Pulp and Paper.. 64
18. Production of Forest Products and Roundwood Removed .. 64
19. External Trade in Forest Products 65

STATISTICAL SUMMARY—IMPERIAL MEASURE

Category	Year Ended 31 March	
	1972	1973
New Zealand Forest Service		
Forest revenue	$26,859,840	$30,135,000
Net cost of forest administration	$5,655,222	$6,706,233
Total area of State forest land	10,081,917 acres	10,118,790 acres
State exotic forests—		
Total stocked area	758,172 acres	799,341 acres
Planted during year	32,156 acres	42,892 acres
Areas restocked during year	12,226 acres	11,382 acres
Clear felled during year	11,237 acres	11,522 acres
Net increase in stocked area	29,226 acres	41,169 acres
Roundwood removed from State forests—		
Indigenous	18.5 million cu ft	18.9 million cu ft
Exotic	104.1 million cu ft	104.7 million cu ft
Total	122.6 million cu ft	123.6 million cu ft
Sawn timber produced*	55.4 million bd ft	57.2 million bd ft
New Zealand		
Area of exotic production forests	1,440,000 acres†	1,512,000 acres†
Net increase in stocked exotic area during year	61,000 acres‡	72,000 acres‡
Roundwood removed from all forests—		
Indigenous	33.5 million cu ft	31.4 million cu ft
Exotic	247.8 million cu ft	259.7 million cu ft
Total	281.3 million cu ft	291.1 million cu ft
Number of registered sawmills	436	422
Sawn timber production—		
Indigenous	175.2 million bd ft	161.2 million bd ft
Exotic	565.3 million bd ft	595.4 million bd ft
Total	740.5 million bd ft	756.6 million bd ft
Sawn timber treated	N.A.	N.A.
Paper production	461,382 tons	446,294 tons
Wood-based panel production (estimated surface area)	200 million sq ft	N.A.
Value of imports of forest products§ (c.i.f.)	$23,438,000	$22,490,000
Value of exports of forest products§ (f.o.b.)	$78,563,000	$83,447,000

*Calendar year. †Estimated. ‡Provisional. §June year. N.A. Not available.

STATISTICAL SUMMARY—METRIC MEASURE

Category	Year Ended 31 March	
	1972	1973
New Zealand Forest Service		
Forest revenue	$26,859,840	$30,135,000
Net cost of forest administration	$5,655,222	$6,706,233
Total area of State forest land	4,080,152 ha	4,095,074 ha
State exotic forests—		
Total stocked area	306,832 ha	323,493 ha
Planted during year	13,014 ha	17,358 ha
Areas restocked during year	4,948 ha	4,606 ha
Clear felled during year	4,548 ha	4,663 ha
Net increase in stocked area	11,828 ha	16,661 ha
Roundwood removed from State forests—		
Indigenous	524 thousand m^3 (r)	535 thousand m^3 (r)
Exotic	2,946 thousand m^3 (r)	2,963 thousand m^3 (r)
Total	3,470 thousand m^3 (r)	3,498 thousand m^3 (r)
Sawn timber produced*	132 thousand m^3 (s)	135 thousand m^3 (s)
New Zealand		
Area of exotic production forests	583,000 ha†	612,000 ha†
Net increase in stocked exotic area during year	24,700 ha‡	29,100 ha‡
Roundwood removed from all forests—		
Indigenous	948 thousand m^3 (r)	889 thousand m^3 (r)
Exotic	7,013 thousand m^3 (r)	7,349 thousand m^3 (r)
Total	7,961 thousand m^3 (r)	8,238 thousand m^3 (r)
Number of registered sawmills	436	422
Sawn timber production—		
Indigenous	413 thousand m^3 (s)	380 thousand m^3 (s)
Exotic	1,333 thousand m^3 (s)	1,404 thousand m^3 (s)
Total	1,746 thousand m^3 (s)	1,784 thousand m^3 (s)
Sawn timber treated	N.A.	N.A.
Paper production	468,764 metric tons	453,435 metric tons
Wood-based panel production (estimated surface area)	18.6 million m^2	N.A.
Value of imports of forest products§ (c.i.f.)	$23,438,000	$22,490,000
Value of exports of forest products§ (f.o.b.)	$78,563,000	$83,447,000

*Calendar year. †Estimated. ‡Provisional. §June year. N.A. Not available.

NOTE—ha=hectare(s)
m^3(r)=cubic metre(s) of roundwood
m^3(s)=cubic metre(s) of sawn wood

CONVERSION FACTORS
1 acre = 0.4047 hectares
1 cubic foot = 0.0283 cubic metres
1,000 board feet = 0.424 cubic metres

FOREST POLICY AND FORESTRY HIGHLIGHTS

THE FORESTS OF NEW ZEALAND

New Zealand has some 24 percent of its land under forest, a fact which has been given a great deal of publicity recently. It is not an important fact, nor has it any particular relevance when compared with the corresponding figures for other countries. What is important, in New Zealand as elsewhere, is that a forest cover should be maintained wherever it constitutes the most desirable form of land use. Forests meet a wide range of basic human needs—social, recreational, and spiritual, as well as economic. The vital question therefore is: Are New Zealand's forests adequate in area, in distribution, in composition, and in condition to satisfy these needs?

The Forest Service answer to this question is and always has been a qualified negative—qualified because New Zealand is fortunate in that a large area of native forests was set aside in the early days in reserves of various types (State forests, climatic reserves, scenery preservation reserves, reserves for the preservation of flora and fauna, and reserves for the growth and preservation of timber). As a result New Zealand is well endowed with forested wilderness and with other native forests having scenic, recreational, and wildlife values. Per head of population New Zealand probably has a larger area of forests of this type than any other developed country. We should be grateful to the early land administrators who had the foresight to make such generous reserves; they laid the basis for a national park, a forest park, and a protection forestry system which is widely envied.

On the debit side it is generally acknowledged that the clearing of forests to make way for pastures extended unwisely over hundreds of thousands of acres on which forests should have been retained. This has happened on steep hill and mountain country in both islands and has led to much induced soil erosion, some of it extremely severe. A protective forest cover must be restored on eroding high country, and this is already being done either by protecting from fire and grazing animals and allowing indigenous second growth to develop or (notably on the precariously unstable headwaters areas of the east coast of the North Island between Gisborne and East Cape) by planting an exotic crop. However the rate of restoration throughout the country is far too slow, not nearly reaching the target of 20 000 acres (8000 ha) a year recommended by the 1969 Forestry Development Conference.

A further legacy of indiscriminate forest clearing for land development has been the creation of hundreds of thousands of acres of marginal or unprofitable farm land. Often such land has reverted to fern, gorse, or scrub and has gone out of production. On some areas that are not reverting the economics of farming, for a variety of reasons, compares unfavourably with those of forestry. In both situations there is a compelling need either to get the land back into production or to improve its productivity through the establishment of forest crops. In this context the Forest Service agrees fully with the views of certain conservation and environmental groups that New Zealand's forests are inadequate in area and should be expanded.

On the debit side also, the sawmilling industry is still encroaching into the remaining podocarp (predominantly rimu) forests without the State or other owners paying enough attention to the subsequent restoration of a commercial forest crop. True, in the absence of adequate rimu or other podocarp regeneration, the Forest Service is converting annually to exotics some 3000 acres (1200 ha) of cut-over forest immediately following logging and about 4000 acres (1620 ha) of old cut-over. However, the backlog is not being overtaken and there are many thousands of acres of recently logged and previously logged rimu forests in both islands in which little is being done. These are reverting to a second growth of scrub hardwoods. This type of vegetation is good for soil and water conservation and for some bird habitats and, after a few years, is scenically not unattractive, but nevertheless it is quite unproductive in utilising the often fertile soils to best advantage and in providing second crops of usable timber.

It is over the handling of cut-over—often derelict—native forest that the Forest Service and most conservation groups part company. The latter abhor introduced pines and feel strongly that no further areas of native forests, irrespective of their condition, should be replaced by exotics. The Forest Service believes that usually it is not in the national interest to leave cut-over forests idle and unproductive unless in this state they serve other more important purposes; indeed in the long run New Zealand cannot afford to neglect them. Rimu normally does not regenerate successfully after logging, whether or not seed trees are left, and it is not adaptable to plantation growing conditions. Even if it were, its extremely slow growth and very long rotation—250 years or more—would make its use economically unacceptable. Thus for production forestry there is no practical alternative to exotics, which in most parts of New Zealand will generally be radiata pine or Douglas fir.

It is a great pity that the much publicised antipathy of conservationists to exotic conifers and particularly to radiata pine blinds so many to the environmental, as well as the economic importance of production forestry. Wood and wood-based products—constructional timber, joinery, furniture, panelling; writing, printing, packaging, and tissue papers; derived chemicals and a host of others—are all essential building blocks for civilisation as we know it, and indeed are essential to the very continuation of civilisation. But an extremely important feature of products from the forest is that, unlike most of the known alternatives to them, they are perpetually renewable. This is not so for most of the known alternatives to them. Minerals and all fossil fuels by their very nature are finite; forests, based as they are on photosynthesis and solar energy, are virtually infinite. It should not be forgotten that forests (and it so happens particularly radiata pine forests) are exceptionally efficient tools for transforming energy from the sun into usable products, and that in the long run solar energy is the only outside input into the earth's system. Production forests, therefore, probably more than any other form of land use, can be used to conserve the world's limited resources of minerals, of fossil fuels, and of energy.

Furthermore, forest products, unlike most other available alternatives (particularly plastics derived from the petro-chemical industry) are recyclable and are therefore conservers instead of one-time utilisers of the world's resources. They are also biodegradable, an environmental virtue they share with other plant fibres and

animal products. Finally forests, whether protection or production, are one of the most efficient types of vegetation for taking carbon dioxide out of the earth's atmosphere and putting oxygen back into it, thus making life possible.

On the counts of perpetual renewability, susceptibility to recycling, biodegradability, and atmospheric exchange, production forests have thus tremendously important although seldom appreciated environmental values. Those conservationists implacably opposed to the replacement with exotics of a very modest proportion of our native forests should perhaps think again. New Zealand will continue to maintain by far the greater part of its forest cover as native forests—for soil and water conservation, for recreation, for the protection of wildlife values, and for the preservation of scenery—but it will also continue to expand the area of its production exotic forests. In so doing it will contribute not only to the economic and environmental well being of present and future generations of New Zealanders but also in a modest way to the betterment of the total environment which all mankind shares.

PROGRESS IN AFFORESTATION

Two years ago a minimum target of 80 000 acres (32 380 ha) annually of new planting was advocated. It is gratifying to record that this national target has not only been reached but exceeded.

In 1972 State and private new planting totalled almost 82 000 acres (33 180 ha). This is 10 000 acres (4050 ha) more than the previous year's achievement and is an indication of the confidence of forest growers, State and private, in the future of forest industries. It comprised 42 892 acres (17 358 ha) established by the Forest Service and an estimated 39 000 acres (15 780 ha) by private interests.

The net increase in effective stocked area, which takes into account restocking of felled areas, clear felling and other changes in stocked area, rose from 61 000 acres (24 700 ha) in the previous year to 72 000 acres (29 140 ha) during 1972.

In view of the large areas of suitable land available for afforestation without significantly prejudicing expansion in the agricultural sector and because of the ever-increasing world demand for wood products of all kinds, a target of 100 000 acres (40 470 ha) a year of new planting is realistic.

MANAGEMENT OF INDIGENOUS FORESTS

This year has been notable for unprecedented public interest in the future of the indigenous forests under the control of the Forest Service. These forests are administered in accordance with the general purposes of the State forests statutes, which are:

- Establishment, culture, growth, protection, maintenance, and management of trees and other plants.
- Utilisation of forest produce.
- Conservation of water.
- Protection of native wildlife.
- Stabilisation of soil.
- Amenity, scientific, and recreational purposes consistent with proper use, management, and utilisation of State forest land.

It will be apparent that for native forest some of these purposes are incompatible and that where they are the public interest must be served by striking a balance between development and utilisation on the one hand and preservation on the other. This has been the basis for planning the future use of both South Island beech forests and the Mamaku–Kaimai group of forests in Rotorua Conservancy.

Mamaku forests—Plans for the Mamaku forests were announced during the year. The forests total 128 000 acres (51 800 ha), of which 25 000 acres (10 000 ha) has been set aside as protection forest reserves and 24 000 acres (9700 ha) as amenity, scientific, and biological reserves. An area of 12 300 acres (5000 ha) has been classed as a long-term timber reserve, the future of which is deliberately held in abeyance. The residual productive area is unsuited to regeneration as a sustained-yield native forest and will thus be maintained as a renewable resource by conversion to plantation. The Mamaku proposals are important as a further example of the approach to be adopted in indigenous forest planning generally.

In both the Mamaku-Kaimai and beech forest proposals the advice of other agencies has been sought. In particular the Wildlife Service of the Department of Internal Affairs has been asked to identify areas of particular value or interest for native fauna, and catchment authorities have been consulted on the likely effects of proposals on soil and water values. As a result of work by the Wildlife Service a considerable area of habitat of the blue-wattled crow (kokako) has been reserved on the Mamaku Plateau. Such consultation again sets the pattern for future work in native forests.

Beech forests—During the year the intensive environmental scrutiny of the Forest Service proposals for utilisation of South Island beech has continued. This examination has taken longer than suggested in the report to Parliament of October 1971* but the schemes are complex and it has been important to ensure that environmental "auditing" is done in depth.

In a report of April 1972 summarising its canvassing of public views and advice†, the Nature Conservation Council expressed satisfaction that beech could be managed as a renewable resource and that it was possible to utilise beech without causing undue harm to the environment. However, the council suggested that proposed areas of conversion to exotic plantations should be investigated more fully in relation to soil and water conservation and that there was a need for more research on all aspects of the project before it was taken further. In August 1972 the council suggested to the Minister of Lands that the proposals for western Southland, excluding Waitutu State Forest, should proceed on a beech management basis plus the planned area of conversion to exotics but that the West Coast and Nelson schemes should be held in abeyance until results were available from the Southland area.

In September 1972, on the recommendation of the Minister of Forests, the beech utilisation proposals were referred to the Cabinet

**Utilisation of South Island Beech Forests,* Wellington, Government Printer, 1971.
†*Report on the Utilisation of Beech Forests,* Wellington, Nature Conservation Council, Information Leaflet No. 9, 1972.

Committee for the Environment. As a consequence a special working party of the Officials Committee for the Environment was convened. This working party had access to a wide range of papers, including the reports of the Nature Conservation Council and correspondence related to them and also reports from Government departments with special interest in or knowledge of the beech forest. The latter included reports by the Department of Scientific and Industrial Research, the Fisheries Management Division of the Ministry of Agriculture and Fisheries, the Wildlife Service of the Department of Internal Affairs, the Forest Research Institute, the Tourist and Publicity Department, the National Water and Soil Conservation Organisation, the Town and Country Planning Division of the Ministry of Works, the Department of Trade and Industry, and the Commissioner for the West Coast. In addition the party visited the West Coast project area. The result of this comprehensive and detailed review of available information was incorporated in the *Environmental Impact Report* of the Officials Committee, which was presented to the Minister for the Environment early in 1973. On his recommendation the Government referred the report to the Environmental Council, and simultaneously a special committee of the National Development Council was set up to report on the beech proposals.

The major finding of the Officials Committee was that subject to some environmental safeguards detailed in its recommendations there appeared to be no environmental reasons why the beech forest schemes should not proceed to the next stage (i.e., the invitation to industry to submit proposals for utilisation). The Officials Committee made 51 recommendations concerning additional reserves areas and statutory safeguarding of reserves, aspects of management requiring particular care, effects on the social environment, responsibility for management of the schemes, formation of a Scientific Co-ordinating Committee, acquisition and inclusion of additional land, and a number of other matters.

The Environmental Council in addition to examining the working papers of the Officials Committee and its final report visited the West Coast project area in March 1973; a small working party also examined the Southland scheme. The council in reporting to the Government stated that the proposals were not an attack on a virgin resource but were in fact a continuation of more than a century of timber exploitation. What was novel was the scale and comprehensiveness of the project. It was suggested that, for these reasons, if the scheme proceeded it should be so planned as to mark the close of the first century of bush felling without the control of environmental standards and to mark the opening of a new era of integrated planning to ensure wise long-term use of forest resources. The council considered that the time span of the project allowed enough time for scientific research, provided it was given adequate resources, to fill in the gaps in knowledge. Subject to some qualifications the council supported the substance and recommendations of the Officials Committee report.

The year has thus seen an environmental examination of the beech utilisation proposals quite unparalleled in its depth by any similar examination of a major Government project. The sense of responsibility and deep interest of the many officials and private persons involved

have been most impressive and the Government has a well-researched basis for making its decision on whether the projects are environmentally satisfactory.

As well as the official investigations there has been a very wide interest by both the public and by conservation groups. Every endeavour has been made in correspondence and discussion to ensure that interested persons have access to all available information; in view of this it is disappointing that much of the criticism of the proposals has been based on misconceptions of their scope and intent.

Kauri forests—In February 1973 the Government announced a policy for the management of kauri in State forests. The prime object is to perpetuate kauri as a species in the interests of science and for public enjoyment both in natural stands and as managed forests. The new policy (details of which are given on p. 17) is the culmination of some years of rethinking and of the growing public concern at the continued logging of kauri. It recognises the unique position this tree holds in New Zealand forestry.

REGIONAL DEVELOPMENT THROUGH FORESTRY

Forestry's main contribution to regional development in New Zealand is through the provision of employment opportunities and the stimulation of industrial development.

In many regions there are extensive tracts of marginally developed or underdeveloped land, seasonal levels of unemployment, and established services that are no longer fully utilised by a dwindling population. Forestry's contribution to regional development is through the employment of resources where this can be seen to be economic or socially desirable in its own right and by encouraging decentralisation which can relieve pressure on overtaxed public facilities elsewhere in the economy.

Other means by which forestry encourages regional development and which have an immediate impact are:

- Considerable and continuing flexibility in designing a programme to accommodate unemployed resources and services.
- Progressive expansion of employment opportunities in tending and administering forests.

In addition there are advantages which have a longer term significance. These are:

- Expansion of employment opportunities in logging and re-establishment of the tree crops.
- A greater range of business activity in the region.
- Development of forest-based rurally oriented industry.
- Stimulation, via strong cross linkages from forests and forest-processing industries, of other industries and services.

As a rural industry, forestry plays an important complementary role to the development of other rural activities. This is especially so with employment; by planning for the availability of winter labour, unemployment is prevented before it arises, and a rural population drift is stemmed. In this way a contribution is also made towards ensuring adequate labour for other rural activities in summer.

The advantages of forestry as a means of encouraging regional development are clearly demonstrated in the well established forestry enterprises in the Bay of Plenty, and opportunities exist for repeating that highly successful planned development elsewhere. Confidence in this potential for expansion has been reflected in increases in planting in recent years in regions that are obviously well suited physically and economically to major developments of the Bay of Plenty type—export-oriented integrated forest industries. There would be few, if any, avenues of regional development in the rural areas of New Zealand offering better long-term opportunities than forestry.

MANAGEMENT OF MOUNTAIN LANDS

The Forest Service has inevitably been drawn into the controversy which has developed over the administration and care of eroding high country being retired from grazing under soil and water conservation farm plans. There are varying estimates of the acreages involved, but it seems that 1.3 million acres (526 000 ha) has been retired and about 2.5 million acres (1 012 000 ha) is still to be retired. The controversial issues include:

- Whether this class VIII* land should remain part of the pastoral run as distinct from being relinquished and becoming unalienated Crown land or State forest.
- The use of class VIII land for safari purposes.
- The availability of such land for recreational purposes.
- The further measures needed to rehabilitate retired land.

For many years the Forest Service has fulfilled its responsibilities by undertaking extensive surveys to describe the condition and trend of mountain lands and by allocating about one-fifth of its research resources to overcoming deficiencies in knowledge of such land, by making increased provision for fire control on all rural and State-owned land, and by mounting noxious animals control programmes. On similar land set aside as State forest the department has been engaged for over a decade in revegetation measures, and more would have been done had finance been available. At the same time it has placed considerable areas in forest parks and recreation areas, thereby providing freedom of access for trampers, climbers, and hunters.

What must be highlighted is the prime object of management of eroded land—soil and water conservation. This can only be achieved by the progressive removal of domestic stock and by the control of fire and noxious animals. But these are only initial steps; they merely remove the malpractices and allow natural healing processes to operate. This healing will be inordinately slow; so great has been the abuse of these lands that positive measures are called for, involving in essence the restoration of a plant cover, whether it be of exotic grasses and clovers, woody shrubs, or trees. Research has shown that a vegetative cover can be obtained over much of the land, but at a price. The problem is whether to wait for results of further research which will reduce these high costs or to use existing knowledge before the situation gets worse. The latter option is coming more and more into favour. Its

*Land classifications are defined in *Land Use Capability Survey Handbook*, Wellington, Ministry of Works, 1969.

overall implementation would be facilitated as would more effective noxious animals control and fire control if land retired from grazing were in unfettered possession of the Crown.

Mounting fire risk—The fire risk in the South Island high-country forests and tussock grasslands, by the very nature of their cover and climate, is high and has increased over the years owing to a build-up in fuels (due in part to retirement of land from grazing) and increased activity by hunters and in pest destruction.

Since 1970 there has been an upsurge in dangerous and difficult fires attributable largely to the growing recreational demands on these wild lands. Effective fighting of some outbreaks has obviously been beyond the financial and technical scope of county fire authorities, and the Forest Service has assisted with specialist equipment and by calling on trained volunteers.

NOXIOUS ANIMALS CONTROL

Over the past decade there has been a spectacular increase in the recovery of the carcasses of deer and other noxious animals and their export overseas as game meat. In the North Island hunters have operated mainly on foot, but in the South Island, in addition to ground hunters, there has developed a substantial industry relying on aerial shooting and recovery of animals by helicopters. The Forest Service has welcomed the contribution made by the hunting firms to the control of noxious animals, particularly in catchments that are of lesser importance and therefore not at present under organised Forest Service control measures.

In the past year there has been even keener demand overseas for New Zealand venison. A shortage in Germany, with little offering from Scotland and eastern Europe, normally major suppliers, has enabled New Zealand exporters to offer higher prices to hunters and there has been fierce competition for supplies. Hunting pressure on noxious animals, particularly red deer, has become very heavy, and disquieting side effects are becoming evident. The rights of others are often being ignored by some of those in the industry. Well-equipped hunting parties, sometimes using helicopters, continue to trespass on occupied land or ignore the constraints placed upon them by the administrators of unoccupied State-owned lands. Higher prices toward the end of the year (some deer being worth over $200) aggravated this situation.

In 1971–72 there were 12 helicopters engaged full-time on venison recovery. At present there are about 30, the increase coming both from existing and new operators. The lifting of import restrictions on helicopters has facilitated this increase.

The situation presents difficulties both to the Forest Service, which wishes to see a continuation of the pressures which can be exerted by a stable industry, and to the operators, who want some limitation on the number of helicopters so that operations remain payable. The problems are complicated by many side issues. The Forest Service believes that some order must be maintained and is taking steps in conjunction with the Civil Aviation Division of the Ministry of Transport to achieve this.

The key to the future prosperity of this industry is undoubtedly continued satisfactory overseas prices and sound marketing by New Zealand suppliers. Export markets are likely to continue to be available, but prices will fluctuate. Diminishing numbers of wild animals will inevitably impose limitations on the game industry, but some of the slack should be taken up by deer farms, the produce from which may have entry to even more attractive overseas markets than are now open to wild game meat. Controlled deer farming on fenced land with no erosion hazard is a wholly desirable development. It is in sharp contrast to deer farming in the sense of deliberately maintaining herds, on a sustained-yield basis, on land that should not be subjected to continued grazing and browsing pressure.

NEW WOOD-BASED INDUSTRY

A wood-based panel material new to New Zealand, refiner board, is to be produced in a $9 million plant to be built in North Canterbury. It will use wood hitherto left on the forest floor, small roundwood of species that have grown poorly and need to be replaced, and slabs and other residues from sawmills.

This development, which completes proposals referred to in last year's annual report (p. 28), will give Canterbury a wood-based enterprise of the type that has so greatly benefited the central North Island. The refiner board plant will complement existing wood-processing industry in Canterbury. The present major sawmills will continue to receive logs from State forests, forwarding their waste to the refiner board plant for processing. Small sawmills will have the opportunity to bid annually for other logs, part of the total available resource in this sale being specifically reserved for this supply.

It is Government policy to extend the sale pattern that has been set for the Canterbury forests to other regions: long-term commitments to foster permanent major processing industries, and short-term sales to provide logs to small efficient sawmillers, who often fill a special local role.

TIMBER SUPPLIES FOR HOUSE BUILDING

The upsurge in house building throughout New Zealand has caused the construction industry to express concern about the availability of adequate timber (see p. 22). Logs from State forests will contribute to the increased requirement of sawn timber, both in the supply of raw material to new mills and in providing additional wood for some established plants. The recently commissioned large sawmill of Carter Oji Kokusaku Pan Pacific Limited, near Napier, will supply part of its output to the domestic market, while logs from the major sale in the Hauraki Plains - Coromandel region (see p. 23) will further boost the supply of sawn timber to the building industry.

Several years ago the Forest Service planned a reduction of log exports to cater for the expected increased demand for wood. The increase has now come and the policy of reducing the export of saw logs needed locally is being implemented as rapidly as possible. Despite the high prices being offered, exports of sawn timber are likewise being restricted. It is pleasing to record that, in general, similar policies are being adopted by the private sector.

Though the log supply from State forests to some existing sawmills has been increased, the Forest Service cannot relieve all shortages, especially in localities where sawmills relying on logs from privately owned forests have now to compete with the log export trade for the available wood, or where supplies have already been exhausted by past log exports. Less than half of the exotic logs sawn in New Zealand come from State forests; it is not practical for the Forest Service, even with its planned reduction of log exports, to supply wood to all sawmills short of requirements, some of which were established without any expectation of drawing on State resources and many of which are remote from them.

COMMERCIAL DIVISION POLICY

In line with the recommendations made by the committee set up by the Minister of Forests in 1969 to inquire into the place and role of the Commercial Division, this year's financial statement on the division's operations (see appendix 14) is presented in a form intended to allow more readily a comparison with company reports.

It is expected that the financial results for the year (ended 31 December 1972) will compare favourably with those of New Zealand industry. However, in making any such comparison it must not be overlooked that this is due in no small measure to taxation benefits associated with export trading—an uncertain basis for maintaining the current level of profitability.

Over recent years large sawmilling units in the private sector have tended increasingly to become part of widely integrated and diversified undertakings so that they can broaden their profit base and also cater for changing trends and fashions in wood use. The distinction between wholesaling and retailing has long since gone and most large sawmillers have chains of retail outlets. So far it has not been policy for State mills to follow such developments. Because of this and other restraints on their commercial business operations while administered under a Government department, the mills must inevitably face mounting competitive disadvantages, with a consequent risk to their viability as a business.

To counteract this trend Waipa and Conical Hill sawmills are being re-equipped and modernised to maintain, and where possible enhance, their customer servicing and profit-earning capacity. Special emphasis is being placed on providing additional factory facilities for the manufacture of a wider range of solid-wood products. There will be some expansion in overall production.

PRODUCTION FORESTRY

MANAGEMENT

Regional management planning—Increasing interdependence between forests and a wider recognition of the social and economic benefits derived from indigenous and exotic forests in regional development emphasise the necessity for planning all forest operations on a regional basis.

Proximity and similarity of management aims are the main criteria considered when grouping forests into regions, thus allowing prescriptions for protection and development operations, regulation of the timber cut, and any other matters to be co-ordinated and expressed in regional management plans, which operate under the authority of the Minister of Forests. Management plans are the formal authorisation for all management activities in State forests and once approved they cannot be altered except by the Minister of Forests on the recommendation of the Director-General of Forests. This legal and administrative safeguard ensures the protection and sound management of forests as a major renewable natural resource.

The most important and fundamental aspect of planning is an appraisal of the objectives, the forest resources, the growth and structure of the forests, and the influences of forests on the environment and on the economy of a region. This allows foresters to formulate local policy and shape future development of forests. Plans are prepared for periods ranging from 5 to 20 years—commonly 10 years—which provides continuity in the manipulation of forest crops and programming of supporting operations.

During the year two regional plans for the indigenous and exotic forests of Northland were completed and plans are well advanced for other regions in Auckland Conservancy and for Hawke's Bay, Nelson, and North Canterbury. Several individual forest plans were also completed.

New kauri policy—Until recently the Forest Service policy for kauri was to conserve this timber by using it sparingly, logging it selectively, endeavouring to regenerate and protect any new growth and at the same time meeting traditional demands for the timber from boatbuilders and other specialty users. Management of kauri can no longer be considered in the context of conserving with wise use; rather is there a need to shift the emphasis to perpetuating the species. The aim in future will be to perpetuate kauri as a species in the interests of science and for public enjoyment, both in natural stands (whether healthy or not) and as managed forests. This policy will be implemented by prescriptions designed to:

- Set aside further large representative areas of mature and immature kauri and kauri associations as forest sanctuaries and as areas dedicated for public enjoyment under the Forests Act 1949.
- Manage the remaining kauri areas as healthy stands, with wood production being incidental to the perpetuation of the species and the permissible annual cut being reduced as quickly as possible to the lowest level consistent with economic, social, and legal constraints.

- Acquire all available substantial areas of kauri regeneration not already in Crown ownership.
- Reinstate a programme of artificial re-establishment on selected sites in State forests and, in co-operation with other agencies, on reserves, domains, and public parks.
- Intensify research into the silviculture and ecology of kauri.

Expansion of forestry in Taupo basin—During the past 4 years the Forest Service has planted over 9000 acres (3640 ha) of Maori-owned land east of Lake Taupo under a long-term lease. This has won approval from the landowners, who wish to extend the concept to a large area of their idle land south and west of Lake Taupo. The proposal is favoured as a means of protecting the waterways of the Tongariro power scheme and of making continued use of buildings and other facilities in Turangi as construction activity declines.

Negotiations are in train to lease 48 000 acres (19 420 ha) of Maori-owned land south of Lake Taupo. About 11 000 acres (4450 ha) will be left in its natural state to preserve it for recreational uses or as part of the scenery. The owners will benefit by a share of the future profits from some 35 000 acres (14 160 ha) to be afforested. The proposals involve exchanges of some Maori land with lands of the Crown to make desirable additions to Tongariro National Park and Kaimanawa Forest Park and at the same time to give the Maori owners more land suitable for afforestation.

Acquisition of land—The Forest Service buys land to add to the area available for exotic afforestation, acquires areas of regenerating kauri, and buys other forested areas to add to protection forests and forest parks. The land acquired is generally of marginal quality for farming, cut-over forest, or areas that have reverted to scrub. If good farm land is included in an area purchased for afforestation it may be made available to neighbouring farmers to give them more economic units, and at the same time the uneconomic parts of these farms may be acquired for afforestation, the changes aiding the development of a better land-use pattern for the district. Under certain circumstances good farm land is retained for afforestation.

During the year 26 271 acres (10 630 ha) were acquired for production forestry and 2967 acres (1200 ha) for protection and recreation purposes; 4097 acres (1660 ha) of permanent State forest and 8147 acres (3300 ha) of provisional State forest were withdrawn. Of the 12 244 acres (5000 ha) withdrawn, 1346 acres (540 ha) were released for farming and 10 797 acres (4300 ha) were transferred to national parks and scenic and other reserves.

SILVICULTURAL OPERATIONS

Planting—New planting by the Forest Service in 1972 was 42 892 acres (17 358 ha), an increase of 10 700 acres over 1971. The private sector contributed an estimated 39 000 acres (15 783 ha), making the national total nearly 82 000 acres (33 185 ha), compared with nearly 72 000 acres last year.

Details of new planting in State forests by planning districts are as follows:

	acres	*ha*
Northland	4 077	1 650
Auckland	3 349	1 355
Rotorua	7 872	3 186
Gisborne	4 045	1 637
Hawke's Bay	4 966	2 010
Wellington and Taranaki	1 718	695
Wairarapa	536	217
North Island	26 563	10 750
Nelson and Marlborough	6 813	2 757
Westland	1 962	794
Canterbury	1 932	782
Otago	3 115	1 261
Southland	2 507	1 015
South Island	16 329	6 609
New Zealand	42 892	17 359

In 1972, 11 382 acres (4606 ha) was restocked by planting, 6227 acres (2520 ha) being in the Rotorua planning district. The net gain in exotic State forest area in 1972 was 41 169 acres (16 661 ha), compared with 29 226 acres (11 828 ha) in 1971. The provisional net gain in exotic forest in 1972, including the private sector, was 72 000 acres (29 138 ha), compared with nearly 61 000 acres (24 700 ha) the previous year.

Species planted—In State forests 39 022 acres (15 792 ha) of new planting and 10 179 acres (4119 ha) of restocking consisted of radiata pine; this was 91 percent of all State planting. Douglas fir was used in 2735 acres (1107 ha) of new planting and 585 acres (237 ha) of restocking. The other species planted were principally eucalypts.

Pruning—Pruning is done to provide clear wood free of defect and thus increase the end uses for wood. The operation is now confined almost entirely to radiata pine and to the pruning of selected trees to 20 ft (6 m) in three stages over 4 to 5 years. In 1972, 7811 acres (3161 ha) were finally pruned to that height. The total area pruned (all stages) was 39 575 acres (16 016 ha).

Thinning—Stands are thinned to concentrate growth on the best trees. Thinning may be done with or without use of the trees eliminated, depending on markets for the available wood. Production of saw logs, pulp logs, and small roundwood from thinnings was 19 310 000 cu ft (546 800 m^3), 2.4 million cu ft (68 000 m^3) more than in 1971–72, involving an area of 6685 acres (2705 ha). Thinning without yield was carried out on 34 510 acres (13 966 ha).

Clear felling—A record 11 522 acres (4663 ha) of exotic State production forest was clear felled, 285 acres (115 ha) more than in 1971–72. In the Rotorua planning district 7229 acres (2926 ha) was cut. The total yield from clear fellings was 83 062 000 cu ft (2 352 000 m^3).

Logging precautions—More attention is being given in the planning of logging to protection of the forest environment. The precautions include greater care in the siting and construction of roads and other earthworks and the retention of forest cover bordering streams.

EXTENSION FORESTRY

In 1963 a loan scheme was introduced to promote afforestation by farmers and local authorities, and with 2567 acres (1039 ha) planted in 1972 the total now stands at 22 752 acres (9207 ha). This scheme was replaced, except for local authorities, by a forestry grants scheme in 1970, and 9284 acres (3757 ha) was planted under this incentive in 1972, bringing the total to 18 317 acres (7413 ha). Thus the two incentive schemes have resulted in 41 069 acres (16 621 ha) being established to date. Under the grants scheme 800 proposals have been approved, embracing 92 000 acres (37 232 ha), of which some 74 000 acres (29 948 ha) have yet to be planted. Activity is centred mainly in north Auckland, the Marlborough Sounds, Otago, and Southland. The target for the combined schemes is 13 000 acres (5300 ha) a year, and there are indications that it could be reached or exceeded in 1973.

Many local authorities favour the development of forests under the Forestry Encouragement Loans Scheme but lack the land and expertise to get a project started. Their interest stems mainly from the realisation that a forest not only will provide direct employment but also will create a renewable source of raw material on which new permanent industry can develop and thereby boost business activity generally. Legislation to facilitate the formation of regional local-authority forests by groups of local bodies is being prepared for presentation to Parliament this year.

Forestry as an industry is gaining increasing public respect. Its place in our developing economy as a supplier of a renewable resource of raw material has brought new interest in forest growing as an attractive investment. Investors are realising that the price paid for wood can at least keep pace with inflation, as has been shown by evidence that prices are rising substantially each year and that the increasing world demand for wood could lead to shortages in the foreseeable future. A further consideration is that, under certain conditions, the value of a forest is excluded from an estate; a relatively small investment now could provide a sizable asset to pass on to beneficiaries. Consequently trust investment houses, large companies, and partnerships of private individuals, both within New Zealand and overseas, are developing investment schemes to establish and manage forests. Many of these investors are seeking financial assistance under the Forestry Encouragement Grants Scheme.

Some owners of suitable land have been reluctant to establish woodlots because of their lack of knowledge of forestry. The past year has seen the start of greater activity in improving and updating extension forestry literature and other educational material. A promotional and

educational film has been produced by the Farm Forestry Association, assisted by the Forest Service, the National Water and Soil Conservation Authority, and a private company. In addition a correspondence course in forestry has been introduced by the Technical Correspondence Institute and a booklet on farm forestry has been published.

FIRE CONTROL

Fire situation—The forest fire risk in the season now concluding, the fourth consecutive year of widespread drought, has been the most serious since the 1945–46 season. For the first time since the Forest and Rural Fires Act came into force in 1947 it was necessary to ban completely the lighting of fires over extensive areas, the restriction applying at one stage to about half the country. Abel Tasman National Park in Nelson had to be closed for a short time, this being the first occasion that such action has had to be taken in a national park. A regional fire emergency was declared briefly over the Hutt Rural Fire District when a fire threatened part of Wellington's water supply catchment.

Fire threat in high country—Over recent years a number of fires in critical high-country areas have prompted an examination of the adequacy of fire-fighting organisation and methods. A strengthening of measures required to prevent the escape of unauthorised fires and the establishment of an efficient system of detection and control are being considered, the aim being to develop closer co-operation between the various fire authorities and to define more clearly their respective responsibilities.

Fire fighting—Although resources were severely taxed and costs were heavy, decisive fire control was maintained. Three potentially serious fires occurred in State forests, but good saves were made. In Otago Coast Forest 250 acres (100 ha) of young pines were destroyed and at Ashley Forest in Canterbury 480 acres (190 ha) of immature trees were burnt. Near Lake Hawea in Central Otago there was a fire in native beech, but it did little damage. Numerous fires were extinguished at an early stage.

There was an alarming upsurge of mischievous fire lighting. This is difficult to counter, but further effort will be put into publicity. Invaluable assistance in a hazardous season was given by the Meteorological Service and by airline pilots in reporting fires.

Land clearing—The area of State forest land and leased Maori-owned land cleared for planting by burning amounted to 55 000 acres (22 260 ha). Of this area 41 000 acres (16 600 ha) was waste land, mainly in gorse, manuka, and other scrub, 8000 acres (3240 ha) was logged areas in pine forests, and 6000 acres (2430 ha) was cut-over native forest.

PRODUCTION, CONSUMPTION, AND TRADE

TOTAL WOOD PRODUCTION

Estimated total production from indigenous and exotic forests increased sharply in the year ended March 1973 to reach 291.1 million cu ft (8 243 000 m^3). This was 9.8 million cu ft (278 000 m^3) higher than the previous year. Indigenous production continued to decline, falling by 2.1 million cu ft (59 000 m^3), to 31.4 million cu ft (889 000 m^3). This represents 10.8 percent of total roundwood removals, compared with 11.9 percent in the year ended March 1972.

Major increases were recorded in the volume of exotic wood produced for the sawmilling industry and for export as logs and chips.

A notable feature was the increased use of sawmill residues by the pulp industry. The pulp industry used 45.9 million cu ft (1 300 000 m^3) of roundwood and 33.0 million cu ft (934 000 m^3) of sawmill residues, compared with 48.9 million cu ft (1 385 000 m^3) and 26.6 million cu ft (753 000 m^3), respectively, the previous year. The consumption of waste paper rose to 4.1 million cu ft (116 000 m^3) of roundwood equivalent, an increase of 0.6 million cu ft (17 000 m^3) over last year.

State forests accounted for 42.5 percent of total wood production, slightly less than the previous year's figure of 43.6 percent.

SAWN TIMBER PRODUCTION

Production of sawn timber from forests under all tenures for the year ended 31 March 1973 amounted to 757 million bd ft. This was 2 percent higher than the previous year's production of 740 million bd ft, but 3 percent below the record production of 784 million bd ft for the year ended 31 March 1971. The rise in production reflects the general improvement in economic conditions in the last 12 months and the upsurge in building activity since mid 1972.

Production of exotic sawn timber increased by over 5 percent to 595 million bd ft, only marginally less than the record production of 596 million bd ft in the year ended 31 March 1971. By contrast, production of indigenous timber fell by 8 percent to 161 million bd ft. The continuing decline in indigenous sawn timber production is due to increasing acceptance of exotics and to the growing use of reconstituted wood products, such as particle board for flooring.

Domestic consumption of sawn timber for the year is estimated to be 226 bd ft a head, an increase of 4 percent compared with that for the previous year. The exact nature and magnitude of reported deficiencies of building materials, including timber, are difficult to determine. However, the situation appears to have arisen from several inter-related factors. The uncertainty associated with building in recent years has contributed to a slowing down of sawn timber production. Sawmillers and timber merchants who had reduced stocks in depressed or uncertain trading conditions found difficulty in meeting the upsurge of demand for building timbers. The problem has been aggravated by over-ordering and by a labour shortage, which has been the main limitation in some localities.

The sawmilling industry has increased output to meet rising demand, production in the 6 months ended 31 March 1973 being estimated at 10 percent higher than for the corresponding period of the previous year. During the same 6 months exports of sawn timber fell by about 2 percent.

FOREST SERVICE PRODUCTION AND SALES

Production—During the year ended 31 March 1973 a total of 123.6 million cu ft (3 501 000 m^3) of roundwood was removed from State exotic and indigenous forests, slightly more than last year's figure of 122.6 million cu ft (3 472 000 m^3).

Indigenous roundwood removals of 18.9 million cu ft (534 000 m^3) were 0.4 million cu ft (11 000 m^3) higher than in the previous year. Removals from State exotic forests also increased marginally during the year to reach 104.8 million cu ft (2 967 000 m^3), a rise of some 0.7 million cu ft (19 000 m^3). Export logs accounted for 20.9 million cu ft (592 000 m^3) of exotic removals, or 20 percent of the total. Except for Nelson Conservancy, exotic removals for individual conservancies were higher than in the year ended March 1972. The largest rise was recorded in Rotorua—an increase from 67.3 million cu ft (1 906 000 m^3) to 72.4 million cu ft (2 050 000 m^3). The decline in exotic removals in Nelson from 15.9 million cu ft (450 000 m^3) to 8.5 million cu ft (240 000 m^3) is a result of the completion of salvage, carried out continuously since 1968, in wind-damaged stands in Golden Downs State Forest.

Sales—During the year, the value of wood sold and removed from State forests amounted to $16.7 million, compared with $13.7 million in 1971–72. This increase in value is due to buoyant domestic and export markets.

Sales of standing timber from State indigenous forests totalled 15.1 million cu ft (427 000 m^3), valued at $1.4 million. Volume and value were both slightly higher than in the previous year. The volume of exotic standing timber sold increased from 51.7 million cu ft (1 464 000 m^3) in 1972 to 55.1 million cu ft (1 560 000 m^3) in the year ended March 1973, and the value rose from $2.4 million to $2.8 million. The average stumpage paid for indigenous species during the year was 9.1c per cu ft ($3.21 per m^3), compared with 8c per cu ft ($2.83 per m^3) the previous year. For sales of exotic species the average stumpage is not meaningful, as sales may include a high proportion of pulpwood. Current stumpages received for large parcels of State forest exotic wood ranged from 8c to 18c per cu ft ($2.82 to $6.36 per m^3) for domestic saw log sales and up to 20c per cu ft ($7.06 per m^3) for export logs. Similarly domestic pulp log sales ranged in stumpage from 0.5 to 3c per cu ft ($0.18 to $1.06 per m^3).

The volume of logs sold, including logs for export, fell slightly to 53.5 million cu ft (1 514 000 m^3), compared with 56 million cu ft (1 585 900 m^3) in the previous year. By contrast, value rose sharply from $10.2 million to $12.4 million, due mainly to the increase in value of exotic logs from $9 million to $11.1 million. Exotic forests contributed 49.7 million cu ft (1 407 000 m^3) and indigenous forests 3.8 million cu ft (107 000 m^3) valued at $11.1 million and $1.3 million respectively.

Sale from Tairua, Athenree, and Maramarua forests—Several proposals received for the utilisation of a total of 3 985 000 cu ft (113 000 m^3) of wood a year from these three exotic forests in the Hauraki Plains – Coromandel region are under consideration. The terms of the sale are 20 years for annual quantities of not less than

1 000 000 cu ft (28 000 m^3) and 5 years for smaller annual quantities, 250 000 cu ft (7000 m^3) being the minimum. Most of the wood will be drawn from the 16 000 acre (6500 ha) Tairua Forest, where large-scale utilisation now begins.

PULP AND PAPER

During the year ended March 1973 pulp production reached a record 590 566 tons (600 015 tonnes), 20 000 tons more than in the previous year. The rise in production is attributable to increased production of chemical pulp, which more than offset a slight fall in the output of mechanical pulp. The new kraft pulp mill of N.Z. Forest Products at Kinleith was completed in January, and at Napier the Carter Oji Kokusaku Pan Pacific Limited refiner groundwood pulp mill started production early in March. The next 12 months should see a considerable increase in output as production comes on stream from these recently completed mills and from the expansion of the Tasman Pulp and Paper Co. Ltd. mill now under construction at Kawerau.

Paper and paperboard production during the year amounted to 446 000 tons (453 000 tonnes), 15 000 tons lower than in the previous year. Production of newsprint fell by 5000 tons and of other paper and paperboard by 10 000 tons.

PANEL PRODUCTS

Figures for production of plywood and particle board are not available because some returns were still outstanding as this report went to press.

The only major development in the panel products industry during the year was the opening of the new particle board plant at Kumeu, a joint venture between N.Z. Forest Products Ltd. and Henderson and Pollard Ltd. The output here should lead to an increase in total production, which last year was 31.1 million sq ft ($\frac{3}{4}$ in. basis), or 35 716 tons (36 289 tonnes).

Fibreboard production of 44 023 tons (44 727 tonnes) was marginally less than last year's 44 807 tons (45 524 tonnes).

The output of plywood is expected to be close to the previous year's figure of 65.9 million sq ft.

COMMERCIAL DIVISION OPERATIONS

Financial statements—As discussed on page 16, the accounts for the year ended 31 December 1972 (appendix 14) are presented in a new form. A major change is that the balance sheet includes a notional capital structure, in which interest is charged on the bank overdraft and term loans portion and provision is made for a dividend to be declared and paid. This capital structure is considered reasonably comparable with that of timber industry companies and has been based on a Reserve Bank survey of public companies.

Profit and appropriations—The consolidated profit for the two sawmills, Waipa and Conical Hill, after providing for all expenses of operation and administration, including $130,516 for interest and

$417,149 for depreciation, was $449,765. This is an increase of 38 percent on the previous year's profit of $325,177 and represents a tax paid return of 10.8 percent on notional shareholders' funds. Profit will be appropriated as follows:

	$
Tax paid profit	449,765
Transfer to fire insurance reserve ..	50,180
Available for distribution ..	399,585
Dividend at 10 percent	208,627
Retained profits	190,958

Production—Sawn timber production was 57.2 million bd ft, compared with 55.4 million bd ft in 1971.

Stumpages—The average stumpage paid by Waipa for all supplies advanced by 0.5c per cu ft (17c per m^3) to 5.5c per cu ft ($1.94 per m^3). For Conical Hill the increase was 0.25c per cu ft (8c per m^3) to 3.75c ($1.32 per m^3).

Marketing—The year closed with Forest Service sawmills being subjected to stronger domestic demand for sawn timber and round produce than had been experienced for many years. There is every indication of these conditions continuing throughout 1973, particularly in the North Island.

The resurgence in domestic demand came when the traditional overseas markets of Australia and the South Pacific were facing a shortage of softwood sawn timber and spiralling prices. Restricted availability from North America resulted in heavy pressure by those markets for additional supplies from New Zealand. Care was taken to ensure that supplies from the two mills were balanced between domestic and export markets. As sales to the latter did not exceed those of the previous year, additional production went to domestic markets. However, to the extent that local commitments allow, the Commercial Division does not intend to depart from its policy of encouraging sales of products in increasingly processed form in its established overseas markets.

Plant modernisation—Satisfactory progress was maintained during the year in modernising and re-equipping Waipa and Conical Hill. Major projects completed or under action at the mills were:

Waipa: A new high-speed top-arbor edger was installed in the bandmill. It is believed to be the first of its kind in New Zealand and has been of particular interest, as it permits the use of fine-gauge circular saws. Trials are under way to evaluate the performance of these edger saws on exotic species. Work on modernising factory facilities has begun with the provision of a new building for such activities as the manufacture of box shooks, pallets, and pre-cut components. The glued lamination section will occupy the entire old box factory, and a first step in this expansion has been the installation of a New Zealand-designed and manufactured unit for structural timber finger jointing to replace scarf jointing. Other projects started include the provision of an improved system of handling full-length logs delivered to the log gantry.

Conical Hill: Good progress has been made on the provision of new planing and factory facilities, which should be operating soon. Replacement of the band headrig, carriage, and drive unit should be completed during 1973, and a new kiln is to be installed to meet the increased demand for dry timber. A new water supply for the mill and adjacent housing was commissioned during the year.

EXTERNAL TRADE

As the latest available official trade statistics are for the year ended June 1972, it has been found necessary to depart from the previous practice of reviewing trade in forest products during the preceding calendar year.

Exports—The value of exports of forest products during the year ended June 1972 increased by 15 percent to $83.4 million. The increase of $10.7 million was spread over all the major commodity groupings, with the exception of sawn timber.

Sawn timber—Sawn timber exports declined slightly during the year. Volume fell from 119.8 million bd ft to 112.4 million bd ft, while value dropped from $11.2 million to $10.7 million. Radiata pine and Douglas fir accounted for 90 percent of this value.

Japan and Australia continue to be the most important importers of New Zealand sawn timber, respectively taking 36 and 40 percent of the total volume exported.

Paper and pulp products—Paper exports increased to 152 200 tons (154 600 tonnes), the major increase being in newsprint, which increased by 19 200 tons (19 500 tonnes). Other paper exports increased by 3900 tons (4000 tonnes). The value of paper and paper products exports increased by $3.6 million to $21.3 million.

Pulp exports amounted to 112 500 tons (114 300 tonnes), an increase of 17 800 tons (18 100 tonnes). This increase occurred despite decrease of exports of 700 tons (700 tonnes) of mechanical pulp. The value of pulp exports increased by $1.9 million to $11.1 million.

The main market for paper and pulp products is Australia, with smaller amounts going to the Philippines and other countries in South-east Asia and the Pacific region.

Log exports—A small increase in volume to 66.1 million cu ft (1 872 000 m^3), coupled with a rise in the unit value, resulted in an increase in the f.o.b. value of log exports from $26.8 million to $30 million. Japan continued to be the main customer for logs, taking 99 percent by value of the total.

Wood chip exports—Exports of wood chips continued to grow, with an increase in value from $1.5 million to $2.3 million.

Other products—Export of panel products increased to 38.4 million sq ft, having a value of $2.2 million. Other forest products exports amounted to $4.2 million.

Imports—In the year ended June 1972 the value of forest products imports totalled $18.8 million c.d.v. (current domestic value in country

of origin), compared with $21.6 million the previous year. The decline has resulted from a reduction in the value of sawn timber, wood pulp, and paper and paperboard imports.

Australia, the United Kingdom, and the United States remain the major suppliers of forest products imports, with Australia supplying some 25 percent of the total by value.

UNFAVOURABLE EXCHANGE RATE ADJUSTMENTS

Adjustments to international exchange rates during the year ended 31 March 1973 were generally unfavourable for export sales, particularly in our two most important markets, Japan and Australia, which together account for over 80 percent of the value of forest products exports. The net effect of changes in exchange rates was that our products became less competitive than those from Canada and the United States. Canada, the United States, and New Zealand benefited equally from a 7 percent revaluation of the Australian dollar and an effective revaluation of the yen of approximately 3 percent, but Canada and the United States gained an export advantage over New Zealand by devaluing their own currencies a further 10 percent.

Despite these trends no overall loss in forest products exports has occurred. Export price increases for most forest products have created exceptionally buoyant trading conditions.

The difficulty of predicting the direction of exchange rate adjustments and their apparent increasing frequency point to the importance of including in all long-term contracts a clause that is designed either to prevent actual financial loss occurring to either of the interested parties as a result of exchange rate adjustments or to allow for periodic price reviews.

RESEARCH AND DEVELOPMENT

RESEARCH

The *Report of Forest Research Institute for 1972,* published separately, deals fully with the year's research programme.

Re-organisation of Forest Research Institute—Mr H. V. Hinds retired as Director of Research during the year and has been succeeded by Dr C. Bassett. The position, formerly at Rotorua, is now at Head Office. The change is aimed at better co-ordination of research, particularly for the Protection Forestry Division, based at Rangiora, and better integration of research with other activities of the Forest Service.

Advisory committee for protection forestry research—During the year a Protection Forestry Research Advisory Committee was formed to advise on the research programme undertaken by the Protection Forestry Division of the Forest Research Institute. It has a broadly based membership representing a wide range of knowledge and experience of the problems of mountain country. All aspects of the Forest Research Institute's research programme are now subject to advice from advisory committees.

Logging research—A recently completed consultant's report on research into log harvesting and transport in New Zealand is being considered in conjunction with the report of a senior Forest Service officer who investigated North American and European logging research organisations last year. These reports suggest there is a need and justification for a logging research association in New Zealand to co-ordinate and intensify research into logging problems and that most attention needs to be given to scientific planning, improvements in methods and design of equipment, and extension services to foster the application of research findings. Studies are also required into environmental and social aspects. Ways and means of setting up, controlling, and financing a research bureau are being investigated.

Present state of research—Following is a brief review of some of the main fields of research in the three divisions of the Forest Research Institute.

Forest products: The basic effort in defining the properties and uses of New Zealand's native and exotic timber species and the mechanism of the simpler processes like drying and preservation is now approaching completion, and the emphasis is gradually changing towards the application of these basic findings to the use of wood in the processing and building industries.

The Forest Products Division of FRI is unusual in that it is a part of a wider organisation which deals also with the research problems of forestry in general. This has led to an integration of forest products research with some aspects of production forestry research and has resulted, for example, in the desirable intrinsic wood properties being included in the criteria for selection in the tree-breeding programme. A comparison of the research programme today with that of 10 years ago confirms that forest products research has been adapting to the needs of the industry.

Protection forestry: Although the protection forests have important secondary values, their main function has always been clearly recognised as the prevention of erosion and the preservation of soil and water values. The management of these forests to the best advantage is achieved mainly by protecting them from harmful agencies, the most serious of which are introduced noxious animals and fire.

The main emphasis in the research programme has been given to the development of techniques to measure trends in the condition of mountain lands, the development of methods to assess animal densities, and the investigation of techniques to rehabilitate deteriorated land. Since the division was established in 1956 much has been achieved in the three main thrusts of research effort, and the ground work has been laid for the adoption of management practices that have a sound scientific basis. Research scientists are now able, with increasing confidence, to begin handing over the techniques that they have developed to the managers of protection forest land to use. Some of the techniques developed will have wide application in forest management generally.

Production forestry: The research programme into production forestry starts with the seed and extends through the cycle of tree growth and beyond into studies of the quality of the wood in relation to the conditions under which it was grown. The emphasis is necessarily on radiata pine, because this species has been used for more than two-thirds of the area planted in exotic forest. The concentration on this species, though having some undesirable features, has produced a tremendous volume of knowledge about this remarkable pine.

Most gains are being made in research on the economics of silviculture. The costs and benefits of pruning, thinning, and other operations are being examined and the profitability of alternative silvicultural systems calculated. Acceptance of the findings of this research is increasing and has already led to changes in forest management and planning.

Research on tree diseases, though a relatively minor part of the total research effort, has led to the successful control of the needle-cast disease *Dothistroma pini*. An extension of research is necessary, however; more work is still urgently needed on the yet undiagnosed deaths of indigenous trees.

Considerably more research has been undertaken on beech forests than many of the department's critics realise. Nevertheless, more is necessary if the tempo of beech management is to increase.

In co-operation with Ministry of Works, research is being undertaken to compare the soil moisture regimes and water yields of a catchment planted in radiata pine and catchments having other forms of vegetative cover.

Radiata pine—After 25 years of research the Forest Research Institute has now built up an impressive body of knowledge on radiata pine—its physiology, pathology, and silviculture; its wood properties; and its utilisation. It is now intended that this knowledge should be summarised and collated in one or more monographs to be published during the next 2 years.

METRICATION

Forestry—The Forestry Metrication Committee formed early last year on the initiative of the Forest Service has established a national standard covering metric units, measurement conventions, measuring equipment, and a timetable for the changeover, scheduled for January 1974. This standard has the approval of the Metric Advisory Board. Steady progress has been made by the Forest Service in the preparation of reference material and tables. Two booklets, *The Metric System in New Zealand Forestry* and *Metric Conversion Tables and Factors for Forestry,* have been published.

Timber sizes—A Standards Association committee on which the Forest Service is represented has completed a specification for standard metric sizes for sawn timber in the green rough sawn, dry, and dressed conditions. The requirements of this standard will be implemented in January 1975 to coincide with the introduction of metric measurement in the building industry.

WOOD USE

Standards—Progress in finalising a number of standards concerned with timber and wood products has been disappointing. However, the Utilisation Development Division has made substantial contributions to various standards committees and to the preparation of draft standards. Grading rule proposals for Douglas fir framing and board grades and for radiata pine and Douglas fir structural grades were prepared during the year and submitted to the New Zealand Sawmillers' Federation for consideration, as also was a revision of the timber design section of the New Zealand *Model Building Bylaw.* The first part of the timber specification standard, which provides guidelines to the wording of specifications covering the use of timber and wood products in building, has been issued for public comment. It is hoped that procedures in finalising a number of standards will be accelerated in 1973–74, particularly those concerned with glued lamination, timber ladders, the timber design section of the *Model Building Bylaw,* and extensions to the timber grading rules.

Research into light timber-frame construction—As a result of the co-ordination of the activities of the three groups involved in research into light frame construction in buildings (the Forest Service, the Building Research Association of New Zealand, and the Engineering School of Auckland University) a considerable advance is hoped for in this field. The Forest Products Division of the Forest Research Institute will carry out the Forest Service programme, with assistance on grading and economic aspects from the Utilisation Development Division. The first part of the programme, the testing of wall frame systems, began in March. Aspects to be examined include the effects of timber grade and moisture content, the use of smaller studs than the traditional 4 in. × 2 in., the use of fewer dwangs or none, and the economics of the use of dry timber for framing.

Economics of drying radiata pine framing timber—A project is under way to determine the most economic method of supplying framing

timber of a specified low moisture content. The use of dry framing is likely to increase steadily in the future as the advantages from its superior strength and stability are fully appreciated.

Beech pulpwood investigations—Studies to determine the variation in basic density of beech species from designated regions in Westland, Nelson, and Southland conservancies, so that green pulpwood volume can be related to bone dry units* of chips, have been completed successfully. The variations in density within and between species obtained from earlier studies have been confirmed.

Use of bark—The Forest Service has been asked by the Forestry Development Council to investigate the use and disposal of bark, particularly the pollution arising from this. Preliminary indications are that disposal problems will be most serious for small- to medium-sized sawmills which are now debarking in order to sell wood residues for chipping. The most promising use for bark is as a compost or soil mulch.

End use survey—The national end use survey of wood and wood products is now in the second year of a 3-year data-collection programme. The results from three categories (residential dwellings, commercial buildings, and manufacturing and other uses) will be published by regions as they become available. This survey will provide basic information for the Forest Service and the wood producing and using industries. Future surveys can then extend these data to provide an index for forest management and industrial development.

Market reports—Officers of the Utilisation Development Division regularly carry out informal market surveys of the timber industry in their areas and provide a report at the end of each quarter. These area reports are collated and a national market report is prepared and published in trade journals. Surveys provide the opportunity for officers to become acquainted with what is happening in the industry and to collect information on trends, developments, and problems to assist planning by industry and the Forest Service.

Timber inspection and quarantine—The rapid development of container shipping services commented on in the 1972 report has continued, and there are now 30 container vessels providing regular fast services between New Zealand and the United Kingdom, Europe, Canada, the east and west coasts of North America, and Australia. The roll-on roll-off Tasman service has been increased, and more vessels are being built for this trade.

Inspection services have been extended to cater for the rapid clearance required for containers in transit, but to some extent this has been negated through inadequate or wrong code marking of container manifests by overseas shippers. Consequently more containers have had to be opened for inspection. Containers marked as having no wood content are frequently found to contain wooden crates and timber dunnage.

No trouble has been experienced with shipments of imported timber. However, with insect flights prevalent in the Rotorua area over the warmer months it has not always been possible to ensure, despite special care, that all export shipments are free from live insects. Several consignments had to be fumigated in Australia after bark beetles were found.

*One bone-dry unit (b.d.u.) = 2400 lb of oven-dry wood.

TIMBER PRESERVATION AUTHORITY

The Timber Preservation Authority implements the Timber Preservation Regulations 1955. It is required to "secure and maintain a high standard of timber preservation" and does this, broadly, by the approval and surveillance of treatment plants and processes and the promulgation of specifications and branding requirements for treated timber. Administrative responsibility for the Timber Preservation Authority was transferred from the Department of Trade and Industry to the Forest Service on 24 April 1972. The Forest Service, which has carried out all technical servicing for the authority since its inception, is now responsible for all its activities.

Seven new plants were registered and six ceased operations, leaving 294 operating at 31 March 1973. During the year it was necessary to suspend the approval of three treating plants which failed to meet the authority's requirements in certain respects and to restrict the approval of two others; one plant was placed on an intensive sampling frequency in the expectation of improved treating standards.

After consultation with the respective purveyors, the authority adopted a new method of measuring retentions in copper-chrome-arsenate-type preservatives, which has resulted in changes in the required retentions of preservatives for round poles, ground-contact timbers, fence palings and battens, exterior joinery, and building timbers exposed to high-decay hazard. Details have been discussed and accepted by the treating industry's representatives on the New Zealand Wood Preservers' Association. The New Zealand Post Office has also accepted them and has agreed to bring its own pole specification into line with the authority's new requirements for this commodity.

Four new preservatives have been approved for use by treatment plants, two being manufactured by an Australian concern and two by a local company.

A new commodity specification, to be designated C4, has been drawn up for sawn radiata pine posts used for urban fencing. A new process specification, to be designated P8, has been promulgated to cover the accelerated boron diffusion process.

ENGINEERING DEVELOPMENTS

Savings from electronic measuring—Two electronic distance-measuring instruments bought early in the year have greatly reduced the time and labour needed for internal forest-control surveys.

Slope mapping—The proportions of easy, moderate, and steep country in a given area are important in determining its suitability for afforestation. This has been difficult to assess without extensive ground reconnaissance surveys and detailed study of aerial photographs. A technique (developed originally by the United States Geological Survey Office) whereby the varying slopes of land can be quickly separated on contour maps by photomechanical means has now been refined by Forest Service draughting staff to suit New Zealand conditions and requirements.

Improved communications—A personal radio paging system has been introduced at Kaingaroa Forest headquarters for fire personnel and for general use. A similar system has been installed at Waipa Sawmill to

locate key personnel quickly on the mill complex. Further installations are planned, such as to increase the efficiency of timber inspection on the wharves at Mt Maunganui.

The progressive replacement of high frequency radio communications systems by very high frequency systems is continuing in exotic forests and in other areas where it is economically justified. At present there are about 250 v.h.f. stations—nearly a fifth of the total number. Expansion of both production and environmental forest activities is increasing the demand for radios, especially where v.h.f. with its very clear and reliable continuous reception operates. To improve fire control, radios are being issued during peak hazard periods to contractors in forests so that they can communicate directly with the forest headquarters in an emergency.

Development of forestry equipment—The Forest Service is associated with industry by way of a Silviculture Equipment Development Committee, which has been involved in the development of tree-lifting machines for nurseries, mechanical tree planters, and gravity rollers for site preparation.

Chain-saw testing—The chain-saw testing programme being carried out by the Engineering Division has been expanded. Tests for noise, vibration and power were carried out on a range of chain saws tendered for supply to Government departments. The Occupational Health Division of the Department of Health has assisted in vibration and noise testing to select saws offering reduced occupational hazard without sacrificing productive capacity. Further testing devices have been designed and built to measure chain cutting speeds and safety qualities; tests for these will begin soon.

ENVIRONMENTAL FORESTRY

CLASSIFICATION OF FORESTS

The zoning of areas according to criteria outlined in the 1970-71 annual report (p. 36) has been applied to the Coromandel and Tararua forest parks. A modification was found necessary in Coromandel Forest Park where there were water supply restrictions over an area zoned "natural environment"; to emphasise this constraint the portion affected was designated "restricted natural environment". In Tararua Forest Park some minor changes are being made to the categories of use originally proposed, quite large areas being classified "wilderness" and the rest of the park "natural environment".

In defining the South Island beech forests three main categories of reserves have been recognised—protection forest, amenity forest, and biological reserves. The classification of biological reserves has shown the need for a form of forest reservation less strict than that of "forest sanctuary" (revocable only by Act of Parliament) but more binding than a working plan reservation (revocable with ministerial consent).

Draft legislation will be submitted in the coming year to enable forest areas to be dedicated, by gazette notice, to a particular use and for revocation of such notice only after the public has had an opportunity to object.

RECREATIONAL DEVELOPMENTS

Recreational policy—The 1972 Forests Amendment Act gave powers for regulations to be made prescribing the conditions whereby persons may enter, remain on, and use State forests. These powers will be used to liberalise public access.

Forest parks—The nine existing State forest parks (six in the North Island and three in the South Island) are providing opportunity for a range of recreational activities for a population that is becoming increasingly mobile. Nearly 2 million acres (800 000 ha) of State forest is now administered as forest park land, though about 340 000 acres (140 000 ha) of this has still to be legally designated as such.

Legal problems have delayed the gazetting of the Lake Sumner and Kaweka forest parks, but this action is expected to be completed shortly, followed by the gazettal of more than 100 000 acres (40 500 ha) of State forest in eastern Southland as Catlins Forest Park.

Six of the seven gazetted forest parks (Coromandel, Pirongia, Kaimanawa, Tararua, North-west Nelson, and Craigieburn) now have formally constituted advisory committees. The appointment of a committee for Rimutaka Forest Park has been delayed by the formation of the Wellington Regional Water Board, which controls part of the area.

The Lake Sumner Forest Park has an advisory committee appointed by the Minister of Forests under his general powers to appoint committees. Similar action will be taken to form the initial committees for Kaweka and Catlins forest parks prior to gazettal. Following gazettal these committees will be reconstituted under the State Forest Park Regulations 1969.

Recreation areas—During the year two additional recreation areas were gazetted, one at Tairua Forest on the Coromandel Peninsula and the other at Hanmer Forest in Canterbury.

Honorary rangers—Valuable assistance in connection with the rapidly increasing use of State forests for recreation continues to be given by honorary rangers. Their presence and identification by a distinctive badge alone tend to temper behaviour and prevent vandalism. The Forest Service greatly values their contribution to public safety and forest protection.

Uniforms—It is desirable for forest officers whose duties necessitate close liaison with the public to wear a readily identifiable uniform. An attractive and functional style is being evaluated and it is hoped to equip all forest park rangers shortly.

SURVEYS OF CATCHMENTS

Resurveys of priority catchments to assess the condition of the vegetation and soils of mountain lands and to determine trends have become of increasing importance in planning the control of noxious animals. Up to now all such assessments have been made by the Protection Forestry Division of the Forest Research Institute. Because of the growing volume of this and other research work consideration is being given to routine surveys of catchments being undertaken in future by conservancy field officers under the supervision of foresters with special responsibilities in protection forestry. The Forest Research Institute would continue to carry out surveys to monitor long-term trends and identify their causes.

FOREST SANCTUARIES

Problems in gazetting forest sanctuaries referred to in last year's report (p. 16) have been resolved. Five of the 10 areas for which gazetting action was proceeding last year have now been given sanctuary status: the Manaia kauris in Coromandel Forest Park; a remnant kauri association on Great Barrier Island; an extensive kauri–beech association in Katikati Forest; the unique kaikawaka (*Libocedrus plumosa*) forest of Hihitahi; and an example of the rare species *Pittosporum dallii* in North-west Nelson Forest Park. These reservations total 13 767 acres (5571 ha) and bring the number of sanctuaries to 13, embracing 38 100 acres (15 419 ha). Investigation of a further 20 proposed sanctuaries is under way, including important and sizable areas containing a range of indigenous forest associations in the Mamaku–Kaimai forests and in the Westland and Southland beech project areas.

NOXIOUS ANIMALS

Bovine tuberculosis—Intensive control of opossums infected with bovine tuberculosis was continued by the special Forest Service unit in the Buller region, where opossums are considered to maintain the infection in cattle. Where they have been reduced to very low numbers there are already firm indications of the effectiveness of control measures. Some cattle herds previously having a high incidence of bovine tuberculosis are now clear or have a much lower level of infection.

The possibility of opossums in other districts having bovine tuberculosis is being investigated. So far infected animals have been detected only on three farms in the Wairarapa.

Deer control in Fiordland—Control of red deer and hybrids in the wapiti area of Fiordland National Park by helicopter shooting began in February 1973. The large numbers killed and their poor condition confirm the 1970 Forest Service scientific survey findings of excessive numbers of animals in this region. The New Zealand Deerstalkers Association co-operated with staff of the Protection Forestry Division of the Forest Research Institute in examining in detail animals obtained in this operation.

OTHER ACTIVITIES

TRAINING

Forestry training and education—Increased interest in forestry is reflected in almost double the normal number of applicants for the department's training schemes. There were 85 forester trainee applicants for 17 positions, 350 for 22 ranger trainee, and 320 for 58 junior woodsman. In all groups there were more applicants with higher educational qualifications than in previous years. This situation has prompted a review of ranger and woodsman training schemes to make sure that best advantage is taken of the availability of such good calibre school leavers to meet the growing needs of the department and of industry.

Eleven forester trainees graduated from the University of Canterbury School of Forestry at the end of 1972, and 12 ranger trainees completed the Technicians' Certification Authority Forest Ranger Certificate course at the Forestry Training Centre.

Three foresters are undertaking post-graduate study at the Canterbury School of Forestry, and 12 scientists are attending overseas universities for post-graduate courses not available in New Zealand.

Training for industry—Although the industry has strongly supported courses in timber utilisation, grading, seasoning, and preservation conducted by the Utilisation Development Division, its support for courses at the Timber Industry Training Centre has tended to diminish. On the other hand overseas countries have continued to recognise the value of such courses, with trainees from Australia, Fiji, Indonesia, Kenya, Malaysia, and West Irian attending in growing numbers during the year.

STAFF CEILING

Past restrictions on increases in staff numbers have had a cumulative effect which began to create some difficulties during 1972. Because it is committed to long-term training programmes for forester, ranger, and woodsman recruits, the department has had to use most of any approved staff ceiling increases to maintain recruitment in these groups. As the time taken to train junior recruits is from 3 to 4 years the benefit of any staff increases has not been immediately apparent.

A further effect of this need to maintain recruitment in the forest-based groups has been the inability to provide a sufficient number of staff to service adequately the department's expanding field operations. However, it is expected that the position will be improved during the coming year, when it should be possible to apply a greater portion of the 1973 approved staff ceiling increase to the filling of essential servicing positions.

OVERSEAS VISITS

The Director-General of Forests and the Conservator of Forests, Auckland, attended the Seventh World Forestry Congress at Buenos Aires. The Deputy Director-General attended the first meeting of the FAO Standing Committee on Forestry in Rome and was a delegate to the United Nations Conference on the Human Environment in Stockholm.

Two visits were made to Australia by the Director of Forest Economics in connection with the New Zealand - Australia Free Trade

Agreement. Consultations and negotiations were undertaken in Australia, the Pacific Islands, Japan, and Korea by the Director of the Commercial Division and the Sales Manager of Waipa Sawmill. The Director and Assistant Director of the Marketing Division negotiated log prices in Japan and Korea, including the first sale of pulp logs.

Other officers attended: the Sixth Congress of the International Biometeorology Society in the Netherlands; the Fourteenth International Entomology Congress at Canberra; the Forty-fourth ANZAAS Congress in Australia; and the FAO Symposium on Production, Handling, and Transport of Wood Chips held in Norway. A Forest Research Institute scientist investigated developments in forest genetics in Chile.

EXTERNAL AID

Departmental officers continue to offer themselves for attachment to Volunteer Service Abroad assistance programmes. The Forest Service gives them every encouragement and prior training to ensure that they can fulfil their duties. Officers who left during the year on VSA assignments were a forest ranger to the New Hebrides and a forest ranger and a forest technician to Fiji.

Training and experience in New Zealand under the Government's bilateral aid programmes were provided during the year for personnel from Malaysia (2), Indonesia (1), India (2), Korea (2), Trinidad (2), and Kenya (4). Subjects covered in these attachments were: high-country protection, wood preservation, forestry training and education, tree improvement, forest management, and sawmilling. Periods of attachment ranged from 1 to 3 months.

In response to a request from the Fiji Government for New Zealand expert assistance in the establishment of a 134 000 acre (54 200 ha) pine afforestation scheme, the Conservator of Forests, Christchurch, and the Assistant Director, Marketing Division, visited Fiji to investigate and report on the economic viability of the scheme and how New Zealand could best provide aid. Following on the recommendations made in this report and a visit by the Forest Service's Chief Civil Engineer to advise on engineering aspects, the Ministry of Foreign Affairs sought the secondment from the Forest Service of a forest manager, roading overseer, mechanical overseer, and surveyor for that part of the total scheme to be known as the Nabou project. An initial planting target of 50 000 acres (20 200 ha) of *Pinus caribaea* in the first 6 years has been set for this project.

The forest manager has commenced duty in Fiji, and other technical experts will leave shortly. This project promises to be the most important example of bilateral assistance in the forestry field which New Zealand has undertaken. It is expected to give a major boost to Fiji's economy.

In response to a request from the government of Indonesia for assistance under the Colombo Plan, the Director of the Utilisation Development Division carried out a feasibility study there on timber utilisation, particularly for low-cost housing. There will be continuing New Zealand technical aid in timber processing and use.

COMPUTER SERVICES

Early in the year the Head Office ICL 7020 computer terminal was connected to the Government Computer Centre ICL machine. Very few difficulties have been experienced with this terminal and by the end of the year performance was satisfactory for current Head Office requirements. However, the service provided by the Government Computer Centre through the remote-entry terminal at Rotorua has not proved entirely satisfactory for the needs of the Forest Research Institute. This matter is under review by the State Services Commission. There has been continuing good progress in systems planning and design to meet the many varied needs of forest management and research.

APPENDIX 1

Area of State Forest Land as at 31 March 1973

(Area in acres)

Conservancy	Permanent State Forest		Provisional State Forest		Total Area of State Forest Land	State Forest Land as Percentage of Total Land Area
	Ordinary	National Endowment	Ordinary	National Endowment		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Auckland ..	791,477	90,509	60,284	4,163	946,435	12.2
Rotorua ..	840,451	327,739	122,295	10,495	1,300,980	16.7
Wellington ..	1,290,664	41,466	37,392	3,152	1,372,677	10.6
Nelson ..	1,693,003	459,946	539,567	258,680	2,951,198	42.1
Westland ..	884,543	425,279	333,489	143,683	1,786,997	46.3
Canterbury ..	620,553	3,647	496	..	624,697	6.2
Southland ..	600,527	56,233	465,305	13,740	1,135,806	6.7
Total ..	6,721,218	1,404,819	1,558,828	433,913	10,118,790*	15.4

*Excludes 198 877 acres administered as State forest land.

Reservations and Withdrawals

	Acres
Land placed under State reservation	60,376
Areas withdrawn from reservation comprised—	
For settlement	1,945
For national parks	6,500
For roads	95
Other	3,386

APPENDIX 2

New Area Planted in State Exotic Forests—by Species

(Area in acres)

Year Ended 31 March	Radiata pine	Douglas fir	Corsican pine	Other	Total
(1)	(2)	(3)	(4)	(5)	(6)
1951 ..	730	680	550	2,130	4,090
1952 ..	2,260	550	710	1,510	5,030
1953 ..	2,690	850	910	1,220	5,670
1954 ..	2,860	740	430	900	4,930
1955 ..	2,960	1,320	480	550	5,310
1956 ..	4,260	1,200	550	690	6,700
1957 ..	3,740	1,680	640	940	7,000
1958 ..	3,920	2,320	1,010	1,230	8,480
1959 ..	2,130	2,090	1,480	1,420	7,120
1960 ..	2,560	1,680	1,080	1,830	7,150
1961 ..	4,760	2,120	880	1,880	9,640
1962 ..	6,550	2,260	1,490	1,470	11,770
1963 ..	9,080	1,850	2,030	2,220	15,180
1964 ..	12,540	1,840	2,096	1,916	18,392
1965 ..	14,695	3,881	1,361	1,498	21,435
1966 ..	15,110	3,048	2,085	304	20,547
1967 ..	15,220	4,113	1,143	747	21,223
1968 ..	17,762	4,962	427	722	23,873
1969 ..	25,303	5,909	671	1,452	33,335
1970 ..	29,024	5,353	474	1,687	36,538
1971 ..	31,317	3,545	240	1,314	36,416
1972 ..	29,145	2,175	67	769	32,156
1973 ..	39,022	2,735	47	1,088	42,892

APPENDIX 3

Establishment and Clear Felling in State Exotic Forests as at 31 March 1973—(a) Totals for Both Islands and New Zealand

(Area in acres)

Region	Operations During Year			Other Changes in Stocked Area	Stocked Area at 31 March 1973	Area Waiting Restocking	Total Productive Area
	New Area Planted	Former Productive Areas Restocked By Planting	Area Clear Felled with Yield				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total North Island, year ended 31 March—							
1973	26,563	8,161	8,971	− 757	571,331	14,241	585,572
1972	19,779	7,257	7,547	−1,994	546,335	15,627	561,962
1971	22,179	6,726	7,693	−4,726	528,840	12,431	541,271
1970	20,989	3,192	6,463	−1,336	512,354	8,380	520,734
1969	19,477	5,621	5,652	−1,632	495,972	4,501	500,473
Total South Island, year ended 31 March—							
1973	16,329	3,221	2,551	− 826	228,010	8,548	236,558
1972	12,377	4,969	3,690	−1,925	211,837	8,553	220,390
1971	14,237	2,173	3,191	− 710	200,106	11,204	211,310
1970	15,549	2,126	3,414	+ 221	187,597	8,286	195,883
1969	13,858	2,967	2,388	+1,103	173,115	8,108	181,223
Total New Zealand, year ended 31 March—							
1973	42,892	11,382	11,522	−1,583	799,341	22,789	822,130
1972	32,156	12,226	11,237	−3,919	758,172	24,180	782,352
1971	36,416	8,899	10,884	−5,436	728,946	23,635	752,581
1970	36,538	5,318	9,877	−1,115	699,951	16,666	716,617
1969	33,335	8,588	8,040	− 529	669,087	12,609	681,696

APPENDIX 3—continued
ESTABLISHMENT AND CLEAR FELLING IN STATE EXOTIC FORESTS AS AT 31 MARCH 1973—(b) BY FORESTS

North Island Conservancies
(Area in acres)

Conservancy and Forest	Stocked Area at 31 March 1972	Operations During Year			Other Changes in Stocked Area	Stocked Area at 31 March 1973	Area Awaiting Restocking	Total Productive Area
		New Area Planted	Former Productive Areas Restocked By Planting	Area Clear Felled with Yield				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Auckland—								
Athenree ..	1,547	..	167	83	— 2	1,629	83	1,712
Aupouri ..	5,749	2,652	..	15	+ 7	8,393	47	8,440
Glenbervie ..	5,705	470	..	..	— 1	6,174	..	6,174
Great Barrier ..	102	..	..	..	..	102	..	102
Katikati ..	47	..	..	..	..	47	..	47
Kauaeranga ..	1,096	..	..	..	..	1,096	..	1,096
Mangawhai ..	1,159	547	..	..	— 4	1,702	..	1,702
Maramarua ..	11,009	51	217	362	— 215	10,700	528	11,228
Omahuta ..	1,215	..	..	..	..	1,215	..	1,215
Puhipuhi ..	1,282	..	19	37	— 39	1,225	185	1,410
Puketi ..	266	..	..	..	..	266	..	266
Pureora ..	5,649	559	44	..	— 265	5,987	..	5,987
Riverhead ..	10,174	6	344	506	— 122	9,896	611	10,507
Russell ..	94	..	..	..	..	94	..	94
Tairua ..	15,462	935	..	74	— 33	16,290	1,230	17,520
Tanui-Kawhia ..	73	40	..	..	..	113	..	113
Tawarau ..	..	60	..	..	..	60	..	60
Waipoua ..	5,258	95	86	120	— 4	5,315	132	5,447
Waitangi ..	3,727	313	..	25	+ 118	4,133	52	4,185
Waiuku ..	2,545	..	116	26	+ 58	2,693	243	2,936
Whangapoua ..	5,463	659	..	..	— 15	6,107	..	6,107
Woodhill ..	14,791	1,039	105	22	..	15,913	..	15,913
Total ..	92,413	7,426	1,098	1,270	— 517	99,150	3,111	102,261
Rotorua—								
Haparangi ..	571	..	..	..	..	571	..	571
Horohoro ..	2,337	96	..	..	..	2,433	..	2,433
Kaingaroa ..	301,317	2,460	5,944	6,810	+ 213	303,124	10,049	313,173
Lake Taupo ..	9,353	3,499	..	..	— 34	12,818	..	12,818
Mangatu ..	14,554	2,272	..	..	..	16,826	..	16,826
Marotiri ..	383	..	..	..	..	383	..	383
Patunamu ..	4,646	169	..	..	— 67	4,748	..	4,748
Rotoehu ..	12,115	631	212	171	— 3	12,784	..	12,784
Ruatoria ..	2,105	1,288	..	..	— 3	3,390	..	3,390
Tihoi ..	1,330	..	..	..	..	1,330	..	1,330
Whaka ..	9,577	694	..	233	— 9	10,029	..	10,029
Whakarata ..	3,656	316	..	..	..	3,972	..	3,972
Whirinaki ..	5,452	492	71	15	+ 7	6,007	..	6,007
Total ..	367,396	11,917	6,227	7,229	+ 104	378,415	10,049	388,464
Wellington—								
Awahohonu ..	..	499	..	..	..	499	..	499
Erua ..	4,175	..	..	..	..	4,175	18	4,193
Esk ..	7,219	1,092	..	..	+ 1	8,312	..	8,312
Gwavas ..	9,993	565	163	194	— 11	10,516	167	10,683
Karioi ..	16,575	11	526	127	+ 40	17,025	267	17,292
Kaweka ..	7,168	1,430	..	..	— 11	8,587	..	8,587
Lismore ..	3,754	331	..	..	+ 1	4,086	..	4,086
Mohaka ..	8,053	1,326	..	..	— 7	9,372	..	9,372
Motuiti ..	31	..	..	..	..	31	..	31
Mount Bruce ..	32	..	..	..	..	32	..	32
Ngaumu ..	14,070	536	..	41	— 364	14,201	41	14,242
Rangataua ..	894	..	..	..	..	894	..	894
Ruahines ..	289	54	..	..	— 10	333	..	333
Santoft ..	4,600	740	147	6	+ 4	5,485	314	5,799
Tangimoana ..	266	..	..	..	+ 17	283	1	284
Tararua ..	881	..	..	..	..	881	..	881
Te Wera ..	2,295	127	..	..	..	2,422	..	2,422
Tinui ..	57	..	..	..	..	57	..	57
Tongariro ..	2,581	..	..	..	+ 5	2,586	..	2,586
Waitarere ..	2,934	184	..	104	— 9	3,005	273	3,278
Waituhui ..	558	208	..	..	..	766	..	766
Rimutaka ..	101	117	..	..	..	218	..	218
Total ..	86,526	7,220	836	472	— 344	93,766	1,081	94,847

APPENDIX 3—continued
ESTABLISHMENT AND CLEAR FELLING IN STATE EXOTIC FORESTS AS AT 31 MARCH 1973—(b) BY FORESTS—*continued*

South Island Conservancies
(Area in acres)

Conservancy and Forest	Stocked Area at 31 March 1972	Operations During Year			Other Changes in Stocked Area	Stocked Area at 31 March 1973	Area Waiting Restocking	Total Productive Area
		New Area Planted	Former Productive Areas Restocked By Planting	Area Clear Felled with Yield				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Nelson—								
Dumgree ..	99	..	..	33	+ 101	167	..	167
Golden Downs ..	52,830	3,493	768	1,171	+ 560	56,480	680	57,160
Hira	3,720	1,039	..	..	+ 84	4,843	..	4,843
Hukawai ..	358	..	..	..	..	358	..	358
Inangahua West	14	14	..	..	..	28	..	28
Motueka ..	4,795	327	..	..	+ 16	5,138	..	5,138
Rai-Whangamoa	6,415	422	..	..	− 15	6,822	..	6,822
Tawhai ..	1,167	42	..	3	− 32	1,174	..	1,174
Wairau ..	1,755	1,376	..	..	− 25	3,106	..	3,106
Waitahu ..	87	100	..	..	..	187	..	187
Total ..	71,240	6,813	768	1,207	+ 689	78,303	680	78,983
Westland—								
Granville ..	694	..	..	..	..	694	54	748
Hochstetter ..	2,986	24	..	..	..	3,010	22	3,032
Hohonu ..	120	..	..	..	..	120	..	120
Ianthe ..	358	87	..	..	− 22	423	20	443
Kaniere ..	376	..	..	..	..	376	..	376
Mahinapua ..	2,079	..	..	..	..	2,079	20	2,099
Mawhera ..	2,528	890	..	..	+ 26	3,444	660	4,104
Nemona ..	1,997	489	..	..	..	2,486	..	2,486
Omoto ..	1,104	290	..	..	..	1,394	..	1,394
Paparoa ..	129	..	..	..	..	129	..	129
Waimea ..	2,552	182	..	..	− 6	2,728	..	2,728
Wanganui ..	61	..	..	..	..	61	..	61
Total ..	14,984	1,962	..	..	− 2	16,944	776	17,720
Canterbury—								
Ashley ..	10,431	1,103	32	96	− 501	10,969	478	11,447
Balmoral ..	19,111	6	185	417	− 99	18,786	953	19,739
Eyrewell ..	10,612	..	591	250	− 98	10,855	5,300	16,155
Geraldine ..	..	431	20	..	+3,948	4,399	2	4,401
Hanmer ..	9,064	..	103	128	+ 5	9,044	105	9,149
Island Hills ..	352	106	..	..	..	458	..	458
Kakahu* ..	3,046	..	..	..	−3,046	..	..	..
Mt. Thomas ..	470	225	..	..	+ 7	702	..	702
Omihi ..	2,687	..	169	..	− 161	2,695	254	2,949
Oxford ..	768	61	..	..	+ 6	835	..	835
Pioneer Park* ..	714	..	..	..	− 714	..	..	..
Raincliff* ..	188	..	..	..	− 188	..	..	..
Total ..	57,443	1,932	1,100	891	− 841	58,743	7,092	65,835
Southland—								
Beaumont ..	4,715	16	284	81	− 131	4,803	..	4,803
Berwick ..	12,164	115	216	26	− 306	12,163	..	12,163
Herbert ..	3,110	154	33	..	..	3,297	..	3,297
Hokonui ..	5,508	292	249	125	− 79	5,845	..	5,845
Longwood ..	3,319	36	1	23	+ 423	3,756	..	3,756
Naseby ..	3,372	101	32	32	− 13	3,460	..	3,460
Otago Coast ..	8,158	2,220	..	..	+ 11	10,389	..	10,389
Otautau ..	8	..	..	..	..	8	..	8
Owaka† ..	1,525	264	..	..	..	1,789	..	1,789
Rankleburn ..	6,290	288	..	..	− 30	6,548	..	6,548
Rowallan ..	1,680	115	..	..	− 8	1,787	..	1,787
Silver Peaks ..	823	221	13	..	..	1,057	..	1,057
Slopedown ..	2,605	508	..	..	..	3,113	..	3,113
Taringatura ..	350	659	..	..	..	1,009	..	1,009
West Tapanui‡	10,176	..	95	166	− 96	10,009	..	10,009
Woodlaw ..	4,367	633	430	..	− 443	4,987	..	4,987
Total ..	68,170	5,622	1,353	453	− 672	74,020	..	74,020

*Kakahu, Pioneer Park, and Raincliff have been absorbed by Geraldine.
†Hinahina, Waikoata, Catlins, and Maclennan amalgamated in Owaka total.
‡Conical Hill, Dusky, and Tapanui amalgamated in West Tapanui total.

APPENDIX 3—continued

Establishment and Clear Felling in State Exotic Forests as at 31 March 1973—(c) by Species

(Area in acres)

Conservancy and Species	Stocked Area at 31 March 1972	Operations During Year			Other Changes in Stocked Area	Stocked Area at 31 March 1973
		New Area Planted	Former Productive Areas Restocked by Planting	Area Clear Felled with Yield		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Auckland—						
Radiata pine ..	68,675	7,050	1,048	1,002	— 56	75,715
Douglas fir ..	3,924	375	..	..	— 213	4,086
Corsican pine ..	5,570	..	..	158	— 240	5,172
Other species ..	14,244	1	50	110	— 8	14,177
Total ..	92,413	7,426	1,098	1,270	— 517	99,150
Rotorua—						
Radiata pine ..	198,770	10,873	5,745	4,188	+1,634	212,834
Douglas fir ..	54,614	982	333	232	+ 20	55,717
Corsican pine ..	30,410	..	..	1,223	— 695	28,492
Other species ..	83,602	62	149	1,586	— 855	81,372
Total ..	367,396	11,917	6,227	7,229	+ 104	378,415
Wellington—						
Radiata pine ..	44,125	6,485	554	337	— 54	50,773
Douglas fir ..	13,949	111	..	..	— 243	13,817
Corsican pine ..	7,038	..	..	25	— 100	6,913
Other species ..	21,414	624	282	110	+ 53	22,263
Total ..	86,526	7,220	836	472	— 344	93,766
Nelson—						
Radiata pine ..	46,933	5,934	526	— 640	+ 512	53,265
Douglas fir ..	11,854	770	178	— 49	+ 6	12,759
Corsican pine ..	6,813	..	..	— 219	+ 33	6,627
Other species ..	5,640	109	64	— 299	+ 138	5,652
Total ..	71,240	6,813	768	—1,207	+ 689	78,303
Westland—						
Radiata pine ..	9,787	1,870	..	..	— 15	11,642
Douglas fir ..	1,126	..	..	..	..	1,126
Corsican pine ..	296	..	..	..	..	296
Other species ..	3,775	92	..	..	+ 13	3,880
Total ..	14,984	1,962	..	..	— 2	16,944
Canterbury—						
Radiata pine ..	32,619	1,554	1,036	726	— 2	34,481
Douglas fir ..	5,570	351	16	..	— 133	5,804
Corsican pine ..	10,712	..	..	56	— 523	10,133
Other species ..	8,542	27	48	109	— 183	8,325
Total ..	57,443	1,932	1,100	891	— 841	58,743
Southland—						
Radiata pine ..	43,929	5,256	1,270	211	+ 51	50,295
Douglas fir ..	7,532	146	58	..	— 5	7,731
Corsican pine ..	9,641	47	12	171	— 695	8,834
Other species ..	7,068	173	13	71	— 23	7,160
Total ..	68,170	5,622	1,353	453	— 672	74,020
New Zealand—						
Radiata pine ..	444,838	39,022	10,179	7,104	+2,070	489,005
Douglas fir ..	98,569	2,735	585	281	— 568	101,040
Corsican pine ..	70,480	47	12	1,852	—2,220	66,467
Other species ..	144,285	1,088	606	2,285	— 865	142,829
Total ..	758,172	42,892	11,382	11,522	—1,583	799,341

Notes—(1) Non-productive afforestation for erosion control is excluded from this appendix.
(2) "Other changes" (column 6) includes purchase or sale of stocked forest, previous year's seeding or regeneration now considered established, clear felling without yield, losses due to fire, corrections due to resurvey, etc.

APPENDIX 4

Pruning and Thinning in State Exotic Forests for the Year Ended 31 March 1973

(Area in acres)

Conservancy and Species	Pruning					Thinned During Year	
	Area Pruned During Year			Total Pruned Area to Date			
	Total Area Pruned	To First Log	To Second Log	To First Log	To Second Log	With Yield	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Auckland—							
Radiata pine ..	4,277	1,042	..	12,950	1,908	1,109	4,497
Douglas fir ..	..	..	..	152	..	..	..
Corsican pine ..	..	..	..	220	..	..	..
Other species ..	214	109	..	2,947	351	61	168
Total ..	4,491	1,151	..	16,269	2,259	1,170	4,665
Rotorua—							
Radiata pine ..	19,622	3,842	..	33,981	1,272	1,392	16,411
Douglas fir ..	142	..	..	10,012	17	2,136	..
Corsican pine ..	..	..	..	5,284	131	24	..
Other species ..	..	..	..	6,672	22	..	..
Total ..	19,764	3,842	..	55,949	1,442	3,552	16,411
Wellington—							
Radiata pine ..	5,365	1,415	..	9,934	115	1,001	2,817
Douglas fir ..	..	..	..	714	..	..	..
Corsican pine ..	..	..	..	592	270	1	..
Other species ..	223	57	..	6,195	24	152	43
Total ..	5,588	1,472	..	17,435	409	1,154	2,860
Nelson—							
Radiata pine ..	1,852	..	..	4,200	333	..	4,741
Douglas fir ..	34	..	..	2,610	1	24	..
Corsican pine ..	..	..	..	4,005	..	..	..
Other species ..	..	..	..	320	..	10	..
Total ..	1,886	..	..	11,135	334	34	4,741
Westland—							
Radiata pine ..	1,920	42	..	426	128	..	1,283
Douglas fir ..	..	..	..	80	..	..	..
Corsican pine ..	..	..	..	..	..	..	..
Other species ..	10	..	..	368	..	..	9
Total ..	1,930	42	..	874	128	..	1,292
Canterbury—							
Radiata pine ..	3,056	866	..	4,511	1,369	271	2,725
Douglas fir ..	230	22	..	917	..	10	11
Corsican pine ..	..	..	..	2,402	6	..	131
Other species ..	38	..	..	642	..	6	106
Total ..	3,324	888	..	8,472	1,375	287	2,973
Southland—							
Radiata pine ..	2,556	416	..	7,639	88	307	1,616
Douglas fir ..	25	..	..	623	..	23	..
Corsican pine ..	2	..	..	1,792	13	134	..
Other species ..	9	..	..	1,997	41	24	12
Total ..	2,592	416	..	12,051	142	488	1,628
New Zealand—							
Radiata pine ..	38,648	7,623	..	73,641	5,213	4,080	34,090
Douglas fir ..	431	22	..	15,108	18	2,193	11
Corsican pine ..	2	..	..	14,295	420	159	131
Other species ..	494	166	..	19,141	438	253	338
Total ..	39,575	7,811	..	122,185	6,089	6,685	34,570

Notes—(1) "Total Area Pruned" (column 2) includes pruning to intermediate steps, e.g., 0–9 ft, 18–27 ft.
(2) "To First Log" (columns 3 and 5) is pruning reaching 16–20 ft. "To Second Log" (columns 4 and 6) is pruning reaching 32 ft.
(3) Where pruning has gone from below first log up to second log in one operation the area has been included in columns (3) and (4).

APPENDIX 5

Protection Forestry—Principal Regions Under Control Operations, 1972–73

Region	Area (acres)	Control Objectives
Urewera forests, including Urewera National Park ..	1,659,000	Erosion and flood control.
Kaweka Range	278,000	,,
Egmont National Park ..	83,000	Protection of indigenous flora and fauna; soil and water conservation.
Ruahine Range	353,000	Erosion and flood control.
Tararua Range	235,000	,,
Wairau catchment	1,307,000	,,
Awatere-Clarence* catchments	1,000,000	Reduce competition of noxious animals with domestic stock.
Motueka catchment ..	200,000	Erosion and flood control.
Buller catchment*	200,000	,,
Hokitika catchment.. ..	293,000	,,
Taramakau catchment ..	12,000	,,
Waiau catchment* ..	447,000	Reduce competition of noxious animals with domestic stock.
Hurunui catchment* ..	265,000	Erosion and flood control.
Waimakariri catchment ..	596,000	,,
Rakaia catchment* ..	349,000	,,
Rangitata catchment* ..	145,000	,,
Kaikoura region	10,000	,,
Waitaki catchment* ..	991,000	,,
Murchison Mountains, Fiordland National Park ..	130,000	Protection of indigenous flora and fauna (including takahe).
Eyre-Takitimu Mountains ..	720,000	Erosion and flood control.
Total	9,273,000	

*Inspected annually—intermittent control where necessary.

APPENDIX 6

Total Timber Removals from Indigenous and Exotic State Forests for the Year Ended 31 March 1973

(Volume in thousand cubic feet)

Conservancy	Indigenous			Exotic			Grand Total
	Logs	Smallwood	Total	Logs	Smallwood	Total	
Auckland ..	2,607	7	2,614	8,511	874	9,385	11,999
Rotorua ..	5,475	12	5,487	71,072	1,322	72,394	77,881
Wellington ..	1,536	10	1,546	3,286	608	3,894	5,440
Nelson ..	2,212	52	2,264	8,453	12	8,465	10,729
Westland ..	6,135	43	6,178	29	..	29	6,207
Canterbury ..	..	..	..	4,524	350	4,874	4,874
Southland ..	780	1	781	5,205	510	5,715	6,496
Total—1972–73 ..	18,745	125	18,870	101,080	3,676	104,756	123,626
1971–72 ..	18,424	120	18,544	100,961	3,136	104,097	122,641
1970–71 ..	18,900	138	19,038	101,753	4,456	106,209	125,247

Notes—(1) This table shows all roundwood removed from State forests under licences, permits, and log sale agreements.
(2) Roundwood for particle board production is included with logs.

APPENDIX 7

Total Smallwood Removals from State Forests

(Volume in thousand cubic feet)

Category	Year Ended 31 March				
	1969	1970	1971	1972	1973
(1)	(2)	(3)	(4)	(5)	(6)
Posts—					
Indigenous	37	21	34	30	23
Exotic	1,681	2,760	3,547	2,479	3,090
Total	1,718	2,781	3,581	2,509	3,113
Other Fencing Material—					
Indigenous	33	28	31	15	20
Exotic	213	200	274	163	147
Total	246	228	305	178	167
Poles—					
Indigenous	2	..	2	2	..
Exotic	206	518	462	332	342
Total	208	518	464	334	342
Other—					
Indigenous	160	91	71	73	82
Exotic	165	108	173	162	97
Total	325	199	244	235	179
Total Smallwood—					
Indigenous	232	140	138	119	125
Exotic	2,265	3,586	4,456	3,137	3,676
Total	2,497	3,726	4,594	3,256	3,801

Note—Chipwood for particle board production is excluded from this table and is included with "Logs" in appendix 6.

APPENDIX 8

Total Timber Removals from State Indigenous Forests by Method of Sale for the Year Ended 31 March 1973

(Volume in thousand cubic feet; Value in $(000))

Conservancy	Logs		Smallwood		Total	
	Volume	Value	Volume	Value	Volume	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) *Sales of Standing Timber*						
Auckland	1,695	294	7	1	1,702	295
Rotorua	3,615	306	12	1	3,627	307
Wellington	1,536	288	10	1	1,546	289
Nelson	2,116	120	33	1	2,149	121
Westland	5,230	290	43	2	5,273	292
Canterbury	..	..	..	..	..	..
Southland	780	70	1	..	781	70
Total—1972–73	14,972	1,368	106	6	15,078	1,374
1971–72	14,772	1,201	115	8	14,887	1,209
1970–71	15,394	1,315	138	7	15,532	1,322
(b) *Sales of Logs*						
Auckland	912	332	..	..	912	332
Rotorua	1,860	683	..	..	1,860	683
Wellington	..	..	..	..	..	..
Nelson	96	14	19	2	115	16
Westland	905	280	..	..	905	280
Canterbury	..	..	..	..	..	..
Southland	..	..	..	..	..	..
Total—1972–73	3,773	1,309	19	2	3,792	1,311
1971–72	3,652	1,129	5	1	3,657	1,130
1970–71	3,506	1,017	..	..	3,506	1,017

Notes—(1) Logs include saw logs and peeler logs.
(2) Values of log sales relate to the value of timber removed and are based on a bush skid or ride price point.

APPENDIX 9

Total Timber Removals from State Exotic Forests by Method of Sale for the Year Ended 31 March 1973

(Volume in thousand cubic feet; Value in $(000))

Conservancy	Logs		Smallwood		Total	
	Volume	Value	Volume	Value	Volume	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) *Sales of Standing Timber*						
Auckland	5,943	541	815	36	6,758	577
Rotorua	36,597	1,333	957	46	37,554	1,379
Wellington	2,309	192	605	35	2,914	227
Nelson	1,680	31	7	1	1,687	32
Westland	29	1	..	..	29	1
Canterbury	4,251	467	291	17	4,542	484
Southland	1,206	104	398	30	1,604	134
Total—1972–73 ..	52,015	2,669	3,073	165	55,088	2,834
1971–72 ..	49,393	2,268	21,358	126	51,751	2,394
1970–71 ..	51,040	2,188	2,875	149	53,915	2,337
(b) *Sales of Logs*						
Auckland	2,568	570	59	14	2,627	584
Rotorua	34,475	8,047	365	79	34,840	8,126
Wellington	977	157	3	1	980	158
Nelson	6,773	1,337	5	1	6,778	1,338
Westland	..	..	..	..	..	..
Canterbury	273	39	59	7	332	46
Southland	3,999	876	112	21	4,111	897
Total—1972–73	49,065	11,026	603	123	49,668	11,149
1971–72	51,612	8,872	778	160	52,390	9,032
1970–71	50,713	8,229	1,581	283	52,294	8,512

Notes—(1) Logs include saw logs, pulp logs, and peeler logs.
(2) This appendix has been adjusted to exclude any log exports by contractors from sales of standing timber and to include them in the sales of logs. Tables (a) and (b) have been corrected for the years shown.
(3) Values of log sales relate to the value of timber removed and are based on a bush skid or ride price point.

APPENDIX 10

Removals of Exotic Roundwood from State Forests by Thinnings and Clear Fellings

(Volume in thousand cubic feet)

Forest	Year Ended 31 March 1973					1971–72
	Logs		Smallwood		Total	
	Thinnings	Clear Fellings	Thinnings	Clear Fellings		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Athenree	..	333	..	1	334	245
Aupouri	..	20	59	4	83	74
Glenbervie	24	..	98	..	122	149
Kauaeranga	..	..	..	..	..	9
Mangawhai	..	..	..	..	..	..
Maramarua	..	2,327	7	97	2,431	2,361
Omahuta	..	..	..	..	..	7
Puhipuhi	..	289	..	16	305	319
Riverhead	..	2,760	..	..	2,760	2,928
Tairua	49	208	..	..	257	23
Waipoua	..	246	..	119	365	224
Waitangi	71	50	104	..	225	141
Waiuku	245	223	211	..	679	626
Whangapoua	..	..	14	..	14	..
Woodhill	1,645	18	132	..	1,795	1,298
Others*	..	2	..	10	12	19
Kaingaroa	12,086	55,105	94	1,125	68,410	64,434
Mangatu	..	..	..	..	..	..
Minginui	69	..	..	..	69	..
Patunamu	26	20	9	1	56	59
Rotoehu	..	1,087	..	..	1,087	1,061
Ruatoria	..	..	..	..	..	..
Waimihia	830	..	..	9	839	..
Whaka	607	1,243	1	82	1,933	1,769
Whirinaki	..	..	..	..	..	..
Esk	..	..	..	..	..	12
Gwavas	245	596	31	6	878	679
Karioi	67	818	87	172	1,144	1,073
Kaweka	..	151	..	..	151	..
Lismore	..	115	..	..	115	3
Motuiti	..	..	..	..	..	16
Ngaumu	422	..	171	4	597	243
Santoft	..	23	52	..	75	274
Tangimoana	..	26	..	..	26	8
Te Wera	..	..	..	..	..	4
Tongariro	..	..	..	1	1	..
Waitarere	454	367	36	48	905	393
North Island	16,840	66,027	1,106	1,695	85,668	78,451
Dumgree	..	21	..	1	22	69
Golden Downs	270	8,151	5	..	8,426	15,846
Rai-Whangamoa	..	2	..	1	3	6
Others*	..	8	..	6	14	3
Mahinapua	..	29	..	..	29	44
Ashley	4	318	10	38	370	201
Balmoral	..	1,812	76	29	1,917	1,261
Eyrewell	..	1,375	..	26	1,401	1,745
Hanmer	78	898	37	135	1,148	1,170
Raincliff	..	..	..	..	..	116
Others*	..	39	..	..	39	27
Beaumont	..	1,534	..	..	1,534	2,271
Berwick	152	50	46	5	253	..
Conical Hill	..	..	..	..	..	1,033
Dusky	..	..	..	..	..	129
Herbert	39	..	1	63	103	41
Hokonui	107	492	115	4	718	905
Longwood	..	..	11	16	27	38
Naseby	24	156	52	8	240	224
Tapanui	283	2,357	5	134	2,779	492
Others*	..	..	65	..	65	69
South Island	957	17,242	407	466	19,072	25,690
New Zealand	17,797	83,269	1,529	2,161	104,756	104,141

*Includes forests producing less than 10,000 cu ft.

APPENDIX 11

New Zealand Forest Service Sawmilling Operations

(a) *Production of Sawn Timber**

(Volume in thousand board feet)

Sawmill	Year Ended 31 December				
	1968	1969	1970	1971	1972
(1)	(2)	(3)	(4)	(5)	(6)
Waipa	40,329	45,354	44,977	44,230	46,899
Conical Hill	8,870	8,839	10,276	11,190	10,311
Total production ..	49,199	54,193	55,253	55,420	57,210

*Includes sleepers.

(b) *Sales of Sawn Timber*

(Volume in thousand board feet)

Details	Year Ended 31 December				
	1968	1969	1970	1971	1972
(1)	(2)	(3)	(4)	(5)	(6)
New Zealand sales—					
Green	11,312	10,770	12,247	13,312	16,758
Air seasoned	1,948	2,262	3,527	3,050	4,600
Kiln dried	1,510	1,953	1,953	2,324	1,429
Treated—					
Wet	10,335	12,054	11,757	11,851	13,106
Dry	1,106	967	1,287	1,626	2,411
Total	26,211	28,006	30,771	32,163	38,304
Export sales—					
Green	16,366	17,529	15,964	15,920	17,938
Air seasoned	185	145	3,529	2,103	123
Kiln dried	1,018	1,280	959	730	504
Treated	81	939	2,528	1,538	669
Total	17,650	19,893	22,980	20,291	19,234
Transfers to box factory ..	1,547	1,331	948	1,515	1,210
Grand total ..	45,408	49,230	54,699	53,969	58,748

(c) *Subsidiary Processing of Sawn Timber*

Year Ended 31 December 1972

	bd ft
Quantity kiln dried	7,175,000
Quantity dressed	21,170,000
Quantity preservative treated* ..	18,700,000

*For further details see appendix 12.

APPENDIX 12

Forest Produce Treated by the New Zealand Forest Service

(a) *Sawn Timber*

(Volume in thousand board feet)

Location of Plant and/or Year	Preservative				Total
	Boron	Creosote	Boliden	PCP*/Fuel Oil	
(1)	(2)	(3)	(4)	(5)	(6)
Waipa	11,190	..	4,376	94	15,660
Conical Hill	1,980	..	..	..	1,980
Total, year ended 31 December—					
1972	13,170	..	4,376	94	17,640
1971	9,821	..	3,674	82	13,577
1970	12,328	..	3,885	61	16,274
1969	12,202	..	3,974	58	16,234
1968	11,479	..	2,882	102	14,463

*Pentachlorophenol.

(b) *Other Timber*

Type and Year	Hanmer	Waipa		Total	
	PCP*/Fuel Oil	Boliden	PCP*/Fuel Oil	Quantity	Volume
(1)	(2)	(3)	(4)	(5)	(6)
	(Quantities in thousands)				000 cu ft
Poles	2.7	2.1	9.7	14.5	140.9
Stockyard posts	7.0	..	1.3	8.3	18.3
Fencing posts	41.7	129.4	90.7	261.8	181.1
Strainers	3.9	9.3	3.7	16.9	45.4
Stays	4.7	0.9	1.2	6.8	6.1
Sawn battens	..	674.3	25.4	699.7	91.2
Sleepers†	..	..	135.5	135.5	315.8
Other	..	3.7	..	3.7	16.6
		(Volume in thousand cubic feet)			
Total, year ended 31 December—					
1972	74	202	539	N.A.	815
1971	93	304	440	N.A.	837
1970	118	282	401	N.A.	801
1969	122	242	413	N.A.	777
1968	93	189	484	N.A.	766

*Pentachlorophenol. †Excluding rejects.

APPENDIX 13

Employment and Training

(a) *Staff and Labour*

Category (1)	Strength, 31 March 1972 (2)	Commenced During Year (3)	Left During Year (4)	Strength, 31 March 1973 (5)
Staff	2,645*	391	326	2,710
Labour—				
Thinning, logging, milling ..	805	750	690	865
Other forestry operations ..	1,548	4,850	4,687	1,711
Control of noxious animals ..	110	230	222	118
Cadet woodsmen	91	60	..	60
Total	2,554	5,890	5,599	2,754
Total staff and labour	5,199	6,281	5,925	5,464

*Includes 42 on leave without pay and 4 on secondment. These have not been included in the estimates of expenditure.

(b) *Training*

Category (1)	Year Ended 31 March 1971 (2)	1972 (3)	1973 (4)
Technical trainees—			
Recruited during year	45	40	36
Studying for degrees in New Zealand ..	58	48	43
Under field training	62	63	74
At ranger schools	28	31	22
Research technicians—			
Recruited during year	16	13	8
Under training	38	36	22
Woodsmen—			
Recruited during year	111	115	60
At woodsmen schools	166	177	124
Clerical cadets—			
Recruited	18	37	29

REPORT OF THE AUDIT OFFICE

To the Director-General of Forests.

The Audit Office, acting under statutory authority, has audited the accounts of the Commercial Division, New Zealand Forest Service, for the year ended 31 December 1972.

The audit included such reviews of the accounting procedures and tests of the accounting records and other supporting evidence as were considered necessary in terms of section 20, Public Revenues Act 1953. All the information and explanations required have been obtained. The financial transactions which have come under notice have been within statutory authority.

In the opinion of the Audit Office the attached balance sheet, accompanying accounts, notes numbered 1 to 9, and statement of source and application of funds give a true and fair view of the state of affairs of the Commercial Division as at 31 December 1972 and of the results of the financial operations for the year.

K. GILLIES,
Controller and Auditor-General.

30 May 1973.

APPENDIX 14

NEW ZEALAND FOREST SERVICE COMMERCIAL DIVISION
CONSOLIDATED ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 1972

A. OPERATING ACCOUNT

	Year Ended 31 December 1972	
	$	$
Gross value of production		9,168,714
Less—		
Cost of logs (note 1)	3,326,092	
Manufacturing expenses (note 2)	3,717,239	
Selling and distribution expenses (note 3)	1,146,442	
Administration and financial expenses (note 4)	493,053	
		8,682,826
Operating profit		485,888
Less net expenditure on employee accommodation (note 5)		11,534
Profit for the year		$474,354

B. PROFIT AND LOSS APPROPRIATION ACCOUNT

	Year Ended 31 December 1972	
	$	$
Net profit from operating account		474,354
Plus profit on sale and disposal of assets		4,644
		478,998
Less payroll tax		29,233
Tax paid profit		449,765
Less appropriation to fire insurance reserve		50,180
Available for distribution		399,585
Proposed dividend		208,627
Retained profits		190,958
Plus balance 1 January 1972	2,794,539	
Less adjustments (note 6)	23,273	
		2,771,266
Accumulated profits		$2,962,224

C. Balance Sheet

	Year Ended 31 December 1972	
	$	$
Funds employed—		
Advances of Government funds		4,486,942
Accumulated profits		2,962,224
Represented by the following notional capital apportionment—		
Bank overdraft	1,190,328	
Term finance	2,086,280	
Accumulated profits and reserves	2,086,279	
Share capital	2,086,279	
	7,449,166	
		7,449,166
Reserve for fire losses		281,613
Total funds employed		$7,730,779
Current assets—		
Sundry debtors, including prepayments (note 7)	2,344,007	
Stocks and stores (note 8)	2,261,089	
		4,605,096
Fixed assets (at cost less depreciation) (note 9)		
Plant, equipment, and tools	2,450,777	
Buildings	682,528	
Houses and employee accommodation	369,048	
Furniture and fittings	5,433	
Other installations	513,847	
		4,021,633
		8,626,729
Less—		
Current liabilities	687,323	
Proposed dividends	208,627	
		895,950
		$7,730,779

The notes which follow form part of and are to be read in conjunction with these accounts.

A. P. Thomson, Director-General.

A. A. B. Webby, Director, Commercial Division.

D. Notes on the Accounts

1. *Cost of Logs*

Expenses of logs to mill and other roundwood extracted under contract to delivery point, after adjusting for opening and closing stocks. Includes an average stumpage for all supplies, both clear fellings and thinnings, as follows:

Waipa:	5.5c per cu ft	($1.94 per m^3)
Conical Hill:	3.75c per cu ft	($1.32 per m^3)

2. *Manufacturing Expenses*

Expenses of manufacturing and processing into finished products in mill yard.

3. *Selling and Distribution Expenses*

Direct wages and salaries of sales staff and yard staff involved in preparing finished products for sale, together with all expenses from mill gate to point of sale.

4. *Administration and Financial Expenses*

Includes:

Interest paid	$130,516
Audit fee	$1,701

5. *Net Expenditure on Employee Accommodation*

Excess of direct outgoings over actual rents determined by agreement between the State Services Commission and the Combined State Services Organisation and the New Zealand Timber Workers Union.

6. *Adjustments*

The deduction from accumulated profits as at 1 January 1972 is made up as follows:

(a) Items relating to previous year's operations—		$
Wage and salary arrears		42,689
Additional log purchase		2,919
Stores account		23
Sales overstated		15,348
		60,979
Less under recovery—		
Export logs		2,893
		58,086
(b) Less reserves formerly shown separately—		
Fleet maintenance reserve	26,362	
General reserve	8,451	
		34,813
		23,273

7. *Sundry Debtors*

Is the net amount after deducting the following:

Provision for doubtful debts	$53,000
Provision for discounts	$8,822

8. *Stocks and Stores*

This item comprises:

Logs and timber stocks	$1,839,031
General stores	$422,058

9. *Fixed Assets*

	Original Cost at 31 Dec 72 $	Cumulative Depreciation $	Additions 1972 $	Deletions 1972 $
Plant, equipment, and tools	5,795,352	3,344,575	787,542	170,059
Buildings	1,263,977	581,449	77,857	1,593
Houses and employee accommodation	702,773	333,725	9,135	..
Furniture and fittings	19,061	13,628	2,212	147
Other installations	816,614	302,767	46,843	2,056
	8,597,777	4,576,144	923,589	173,855

Depreciation provided in 1972 was $417,149.

E. Highlights

Gross value of production ($000)	9,169
Production (000 bd ft)	57,210
Total personnel employed	811
Total remuneration to employees ($000)	3,337
Tax paid profit $	449,765
Proposed dividend $	208,627
Retained profits $	190,958
Percentage of profits retained	48
Total assets ($000)	8,627
Working capital ($000)	2,519
Total funds employed ($000)	7,731

F. Statistics

Dividend rate (percent)	10
No. of times covered by profit	2.2
Tax paid profit to:	
(a) Shareholders funds (percent)	10.8
(b) Gross sales (percent)	4.9
(c) Share capital (percent)	21.5
(d) Total funds employed (percent)	5.8
Current assets to:	
(a) Current liabilities	2.2:1
(b) Stocks	2.0:1

G. Comparative Statement

Because of its extremely limited value owing to major changes in the compilation and presentation of the accounts, no comprehensive statement comparing this year's results with those of previous years has been included. However, the intention is to build progressively towards a comparative statement showing highlights and statistics over a full 5-year period.

H. Source and Application of Funds

	$
Funds came from:	
Profit from trading	399,585
Increase in reserves	50,000
Depreciation	417,149
Advances from Government	1,509,114
Proceeds from the sale of fixed assets	24,695
Total funds available	$2,400,543
These funds were applied in:	
Acquisition of fixed assets	923,589
Increase in current assets	219,995
Decrease in current liabilities	1,256,959
	$2,400,543

REPORT OF THE AUDIT OFFICE

To the Director-General of Forests.

The Audit Office, acting under statutory authority, has audited the accounts of the New Zealand Forest Service for the year ended 31 December 1972.

The audit included such reviews of the accounting procedures and tests of the accounting records and other supporting evidence as were considered necessary in terms of section 20, Public Revenues Act 1953. All the information and explanations required have been obtained. The financial transactions which have come under notice have been within statutory authority.

In the opinion of the Audit Office the attached balance sheet and accompanying accounts give a true and fair view of the state of affairs of the Forest Service as at 31 December 1972 and of the results of the financial operations for the year.

K. GILLIES,
Controller and Auditor-General.

30 May 1973.

APPENDIX 15

New Zealand Forest Service Accounts for the Year Ended 31 December 1972

(a) General Administration Account

Year Ended 31 December 1971			Year Ended 31 December 1972	
$	*$*		$	$
		Charges incurred directly in respect of—		
58,539		Fire prevention and precaution and administration of fire districts	68,840	
2,318,832		Technical investigations, research, etc.	2,919,260	
117,193		Assistance to public and private forestry	255,757	
137,907		Timber inspection and termite control	164,408	
508,381		Control of noxious animals	605,896	
531,888		Work for other departments	898,422	
277,406		Staff training, including Rotorua training centre	372,382	
245,427		Payments to local authorities for roading purposes (fifths)	236,086	
4,195,573			5,521,051	
471,860		*Less* fees for inspection, recoveries from other departments, etc.	847,250	
	3,723,713			4,673,801
		General administration expenses—		
3,204,074		Staff expenses, including salaries, overtime, travelling, and general expenses	3,393,069	
501,033		Office expenses, including postages, stationery, and general expenses	705,057	
363,487		Maintenance and depreciation of administrative buildings, equipment, etc.	506,755	
144,298		Miscellaneous general expenses	139,530	
4,212,892			4,744,411	
2,231,308		*Less* amounts charged against forests and other activities as "overhead"	2,662,506	
14,041		*Less* amounts charged against mills as "overhead"	7,603	
	1,967,543			2,074,302
	5,691,256			6,748,103
	36,034	*Less* miscellaneous revenue		41,870
	$5,655,222	Net deficit in Administration Account transferred to Consolidated Revenue Account in balance sheet		$6,706,233

(b) Forest Development and Management Accounts (excluding Waipa and Conical Hill Sawmills)

Year Ended 31 December 1971			Year Ended 31 December 1972	
$	*$*		$	$
3,382,122		Establishment	4,785,510	
1,189,087		Tending	1,920,870	
619,304		Protection	829,562	
5,207,546		Maintenance of assets and miscellaneous expenses	6,745,889	
383,939		Depreciation of assets	842,645	
2,231,308		Overhead charged to forests and credited to General Administration Account	2,662,505	
7,646,017		Cost of utilisation	8,210,039	
	20,659,323			25,997,020
		Less—		
12,458,754		Sale of logs	16,172,770	
2,718,996		Sales of standing timber	2,910,650	
179,614		Miscellaneous revenue	208,121	
	15,357,364			19,291,541
	$5,301,959	Net costs transferred to "Development and management" in the balance sheet		$6,705,479

APPENDIX 15—continued

New Zealand Forest Service Accounts for the Year Ended 31 December 1972—*continued*

(c) Consolidated Balance Sheet

Year Ended 31 December 1971			Year Ended 31 December 1972	
$	*$*		$	$
		Fixed assets (at cost)—		
	9,495,162	Land taken over or purchased		9,969,189
15,706,583		Buildings, including houses and camps	16,630,056	
17,073,917		Roads, bridges, tracks, etc.	19,313,554	
13,591,229		Plant and vehicles	14,735,812	
4,811,078		Other assets	5,283,009	
51,182,807			55,962,431	
13,526,585		*Less* provision for depreciation	14,565,600	
	37,656,222			41,396,831
		Development and management (net costs)—		
48,599,128		Balance as at 1 January 1972	53,901,087	
5,301,959		*Plus* net costs for the year	6,705,479	
	53,901,087			60,606,566
	922,791	Forestry Encouragement Loans*		1,085,371
		Current assets—		
4,279,281		Sundry debtors	5,000,548	
13,000		*Less* provision for bad debts (departmental mills)	53,000	
	4,266,281			4,947,548
	2,810,868	Stocks and stores (at cost)		2,950,959
		Intangible assets—		
	30,072,312	Interest capitalised but not charged against specific assets		32,755,044
	$139,124,723			$153,711,508
		Capital—		
49,068,728		National Development Loans	55,963,960	
6,895,232		*Plus* net payments for year	13,072,239	
	55,963,960			69,036,199
44,643,674		Consolidated Revenue Account	45,346,158	
6,357,706		*Plus* net payments for year	4,635,085	
51,001,380			49,981,243	
5,655,222		*Less* net deficit in General Administration Account	6,706,233	
45,346,158			43,275,010	
32,839,009		*Plus* accumulated interest on National Development Loans	35,652,258	
	78,185,167			78,927,268
		Accumulated profits and reserves—		
2,794,540		Profits of Waipa and Conical Hill sawmills	2,962,224	
363,284		Fire and other reserves	380,320	
	3,157,824			3,342,544
		Current liabilities—		
138,368		Cash held on deposits	125,597	
138,368		*Less* cash held against same	125,597	
	1,817,772	Sundry creditors		2,405,497
	$139,124,723			$153,711,508

*Approximately only half repayable in terms of Forestry Encouragement Loans Regulations 1967.

A. P. Thomson, Director-General.

D. L. Hard, Chief Accountant.

APPENDIX 16

Production of Rough Sawn Timber for the Year Ended 31 March 1973

(a) *By Species*

(Volume in thousand board feet)

Conservancy	Indigenous								Exotic				All Species			Sawmills Registered 31 March 1973
	Rimu and Miro	Matai	Totara	Kahikatea	Kauri	Tawa	Beech	Minor Species	Exotic Pines	Douglas Fir	Eucalypts	Minor Species	Indigenous	Exotic	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Auckland	15,796	1,713	813	1,278	1,280	923	249	218	59,826	275	651	1,062	22,270	61,814	84,084	105
Rotorua	25,475	2,178	844	1,640	..	5,248	13	137	302,281	56,009	662	128	35,535	359,080	394,615	47
Wellington ..	18,214	3,552	2,161	2,185	5	72	8	42	52,022	3,624	33	1,538	26,239	57,217	83,456	85
Nelson	10,375	17	4	544	..	29	1,353	3	30,975	3,506	13	101	12,325	34,595	46,920	59
Westland	43,293	169	69	6,122	..	..	944	26	179	..	..	..	50,623	179	50,802	26
Canterbury ..	10	43	..	1	..	..	..	..	48,434	557	225	689	54	49,905	49,959	55
Southland.. ..	5,926	77	36	266	..	..	7,796	47	29,356	2,671	37	533	14,148	32,597	46,745	45
North Island—																
1972–73 ..	59,485	7,443	3,818	5,103	1,285	6,243	270	397	414,129	59,908	1,346	2,728	84,044	478,111	562,155	237
1971–72.. ..	64,557	7,129	4,183	5,827	1,623	9,709	133	741	392,963	55,442	801	7,872	93,902	457,078	550,980	239
1970–71.. ..	72,113	11,007	4,901	6,245	1,654	7,278	87	647	430,162	46,961	1,196	5,023	103,932	483,342	587,274	255
South Island—																
1972–73.. ..	59,604	306	109	6,933	..	29	10,093	76	108,944	6,734	275	1,323	77,150	117,276	194,426	185
1971–72.. ..	63,896	364	126	7,211	6	10	9,585	93	101,775	5,678	274	477	81,291	108,204	189,495	197
1970–71.. ..	65,766	355	114	6,485	..	2	11,200	62	105,799	5,621	277	1,310	83,984	113,007	196,991	202
New Zealand—																
1972–73.. ..	119,089	7,749	3,927	12,036	1,285	6,272	10,363	473	523,073	66,642	1,621	4,051	161,194	595,387	756,581	422
1971–72.. ..	128,453	7,493	4,309	13,038	1,629	9,719	9,718	834	494,738	61,120	1,075	8,349	175,193	565,282	740,475	436
1970–71.. ..	137,879	11,362	5,015	12,730	1,654	7,280	11,287	709	535,961	52,582	1,473	6,333	187,916	596,349	784,265	457

Note—(1) This table is based on statistics collected by the New Zealand Forest Service in connection with the annual registration of sawmills.

(2) Indigenous Minor Species (column 9) for 1972–73 include—taraire, 160,000 bd ft; tanekaha, 62,000 bd ft; hinau, 48,000 bd ft; rewarewa, 62,000 bd ft; puriri, 20,000 bd ft; other and unspecified, 121,000 bd ft.

(3) Exotic Minor Species (column 13) for 1972–73 include—larch, 1,377,000 bd ft; macrocarpa, 1,910,000 bd ft; poplar, 116,000 bd ft; redwood, 68,000 bd ft; other and unspecified, 580,000 bd ft.

(4) This table includes the production of sawn sleepers; 4,110,000 bd ft was produced in 1972–73.

APPENDIX 16—continued

(b) *By Land Ownership*

(Volume in thousand board feet)

Conservancy	Indigenous					Exotic				Grand Total
	State Forest Land	Unoccupied Crown Land	Maori Land	Private Land and Crown Leasehold	Total	State Forest Land	Local Authority Land	Company and Private Land	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Auckland	16,853	..	1,913	3,504	22,270	37,072	381	24,361	61,814	84,084
Rotorua	17,117	..	8,282	10,136	35,535	169,052	152	189,876	359,080	394,615
Wellington	9,575	..	5,453	11,211	26,239	13,576	6,313	37,328	57,217	83,456
Nelson	8,343	255	..	3,727	12,325	16,583	583	17,429	34,595	46,920
Westland	36,427	2,153	52	11,991	50,623	179	..	..	179	50,802
Canterbury	23	..	..	31	54	23,567	11,843	14,495	49,905	49,959
Southland	5,301	..	7,783	1,064	14,148	21,436	2,468	8,693	32,597	46,745
North Island—										
1972–73	43,545	..	15,648	24,851	84,044	219,700	6,846	251,565	478,111	562,155
1971–72	40,391	4,113	16,508	32,890	93,902	198,114	3,133	255,831	457,078	550,980
1970–71	41,064	6	28,917	33,945	103,932	198,672	5,113	279,557	483,342	587,274
South Island—										
1972–73	50,094	2,408	7,835	16,813	77,150	61,765	14,894	40,617	117,276	194,426
1971–72	53,566	178	11,458	16,089	81,291	61,928	13,025	33,251	108,204	189,495
1970–71	54,568	739	9,561	19,116	83,984	55,424	20,237	37,346	113,007	196,991
New Zealand—										
1972–73	93,639	2,408	23,483	41,664	161,194	281,465	21,740	292,182	595,387	756,581
1971–72	93,957	4,291	27,966	48,979	175,193	260,042	16,158	289,082	565,282	740,475
1970–71	95,632	745	38,478	53,061	187,916	254,096	25,350	316,903	596,349	784,265

APPENDIX 17

Production of Pulp and Paper in New Zealand

(Quantity in tons of 2,240 lb)

Year Ended 31 March	Wood Pulp			Fibreboard	Paper and Paperboard		
	Mechanical	Chemical*	Total		Newsprint	Other Paper and Paperboard	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1965 ..	203,372	193,029	396,401	31,736	184,317	126,809	311,126
1966 ..	217,743	193,181	410,924	33,771	195,606	153,548	349,154
1967 ..	205,345	223,860	429,205	32,878	183,886	170,435	354,321
1968 ..	221,159	252,442	473,601	33,075	195,546	175,931	371,477
1969 ..	230,975	255,000	485,975	38,288	199,530	189,994	389,524
1970 ..	241,110	311,882	552,992	39,553	204,137	234,816	438,953
1971 ..	254,858	312,065	566,923	43,653	210,538	244,048	454,586
1972 ..	258,478	312,975	571,453	44,807	214,577	246,805	461,382
1973 ..	256,427	334,139	590,566	44,023	209,863	236,431	446,294

*Includes semi-chemical pulp.

APPENDIX 18

Estimated New Zealand Production of Forest Products in Roundwood Equivalent and Actual Roundwood Removals for the Year Ended 31 March 1973

(Volume in million cubic feet)

Category	Indigenous Wood	Exotic Wood	Total
(1)	(2)	(3)	(4)
Logs for export	0.3	71.9	72.2
Chips for export	1.1	9.7	10.8
Sawn timber	26.9	116.6	143.5
Pulp and pulp products	1.8	81.2	83.0
Peelers, veneer, and plywood	1.0	2.3	3.3
Smallwood and miscellaneous	0.3	15.1	15.4
Total (roundwood equivalent)	31.4	296.8	328.2
Less waste used in pulp production—			
Sawmill residues	..	33.0	33.0
Waste paper	..	4.1	4.1
Total actual roundwood removed—			
1972–73	31.4	259.7	291.1
1971–72	33.5	247.8	281.3
1970–71	35.8	253.6	289.4
1969–70	36.5	239.5	276.0

Note—(1) Smallwood and miscellaneous is partly estimated. (2) Firewood is excluded. (3) Waste paper does not include broke or trimmings from producers' own machines.

APPENDIX 19

External Trade of New Zealand in Forest Products

(a) *Imports of Timber*

Calendar Year	Sawn Timber							Total Sawn Timber	Sleepers	Logs and Poles
	Hardwoods			Softwoods						
	Australian	Oak	Other	Douglas Fir	Redwood	Cedar	Other			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	(Volume in thousand board feet)									Thousand cu ft
1966 ..	7,636	141	5,879	4,957	4,188	12,587	1,672	37,060	2,238	689
1967 ..	5,651	12	4,671	3,430	2,944	7,464	1,556	25,728	10	569
1968 ..	4,123	96	2,939	2,044	1,590	4,628	950	16,370	114	515
1969 ..	4,197	72	4,576	1,781	3,022	4,836	781	19,265	27	467
1970 ..	4,391	102	6,670	2,684	1,815	4,958	327	20,948	2	506
1971 ..	4,241	18	4,253	1,556	824	3,225	367	14,484	..	443
1972 ..	3,979	59	3,831	1,175	769	3,157	406	13,376	..	329
	(Value in $(000))									
1966 ..	960	22	712	458	396	1,424	248	4,220	196	424
1967 ..	725	3	510	300	294	826	213	2,871	..	335
1968 ..	633	17	417	283	221	707	142	2,420	17	366
1969 ..	682	19	721	307	576	949	149	3,403	4	345
1970 ..	737	33	1,251	499	368	1,127	62	4,077	..	674
1971 ..	773	9	826	256	197	630	79	2,770	..	474
1972 ..	789	21	687	209	196	595	82	2,579	..	414

(b) *Exports of Timber*

Calendar Year	Indigenous			Exotic					Total Sawn Timber	Sleepers	Logs and Poles	Chips
	Beech	Other	Total	Radiata Pine		Douglas Fir	Other	Total				
				Sawn	Cases							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	(Volume in thousand board feet)										Thousand cu ft	b.d.u.*
1966	61	19	80	27,616	959	3,100	111	31,786	31,866	..	18,975	..
1967	68	438	506	32,236	2,134	4,397	321	39,088	39,594	..	28,106	..
1968	338	3,766	4,104	63,640	2,913	20,193	197	86,943	91,047	..	50,882	..
1969	447	3,766	4,213	74,400	2,423	24,887	549	102,259	106,472	14	59,032	..
1970	1,834	3,871	5,705	76,825	2,020	25,704	2,831	107,380	113,085	..	64,294	69,848
1971	1,048	2,489	3,537	91,825	1,217	26,818	5,409	125,269	128,806	7	64,315	85,466
1972	978	2,089	3,067	76,483	..	27,895	5,380	109,758	112,825	..	66,094	77,782
	(Value in $(000))											
1966	8	4	12	1,706	106	232	10	2,054	2,066	..	4,744	..
1967	4	63	67	1,982	223	343	24	2,572	2,639	..	7,120	..
1968	50	548	598	4,130	490	2,147	13	6,780	7,378	..	16,507	..
1969	67	520	587	5,283	139	2,797	80	8,299	8,886	2	22,550	..
1970	229	761	990	6,218	250	2,920	320	9,708	10,698	..	24,830	1,793
1971	135	547	682	7,896	194	3,066	494	11,650	12,332	7	28,548	2,179
1972	128	432	560	6,284	..	3,297	429	10,010	10,570	..	30,028	2,275

Source: Department of Statistics; prepared by the New Zealand Forest Service.

Note—(1) The basis for valuation is: imports, c.d.v.; exports, f.o.b.
(2) The figures for 1972 are for the June year.

*b.d.u. = bone dry unit; 1 b.d.u. = 2,400 lb of oven dry wood.

APPENDIX 19—continued

EXTERNAL TRADE OF NEW ZEALAND IN FOREST PRODUCTS—*continued*

(c) *Imports of Pulp and Paper*

Calendar Year	Wood Pulp	Fibreboard	Paper and Paperboard		
			Newsprint	Other Paper and Paperboard	Total
(1)	(2)	(3)	(4)	(5)	(6)
		(Quantity in tons of 2,240 lb)			
1966	22,180	215*	2,026	25,406	27,432
1967	21,397	55*	776	19,030	19,806
1968	10,247	172*	677	24,130	24,807
1969	10,902	36*	775	18,460	19,235
1970	18,562	119*	486	27,715	28,201
1971	14,396	26*	485	19,439	19,924
1972	12,716	42*	354	26,930	27,284
		(Value in $(000))			
1966	1,944	10	222	7,462	7,684
1967	1,887	4	83	5,988	6,071
1968	987	8	109	7,834	7,943
1969	1,235	1	123	8,987	9,110
1970	3,260	3	80	10,150	10,230
1971	1,142	1	79	9,004	9,083
1972	1,684	5	63	9,464	9,527

(d) *Exports of Pulp and Paper*

Calendar Year	Wood Pulp	Fibreboard	Paper and Paperboard		
			Newsprint	Other Paper and Paperboard	Total
(1)	(2)	(3)	(4)	(5)	(6)
		(Quantity in tons of 2,240 lb)			
1966	74,269	3,856*	110,670	2,397	113,067
1967	72,705	3,712*	107,681	3,804	111,485
1968	92,547	11,813*	117,701	17,448	135,149
1969	78,621	20,596*	118,438	26,872	145,310
1970	96,038	15,462*	116,705	26,032	142,737
1971	98,867	22,707*	124,881	17,833	142,714
1972	112,457	24,107*	128,868	23,243	152,111
		(Value in $(000))			
1966	6,148	150	11,482	420	11,902
1967	5,911	154	12,091	613	12,704
1968	6,864	431	16,093	2,490	19,014
1969	6,746	725	15,769	3,635	19,404
1970	9,127	653	15,276	4,521	19,797
1971	9,765	1,038	16,018	3,697	19,715
1972	11,172	1,192	16,503	4,696	21,199

*In thousand square feet.

Source: Department of Statistics; prepared by the New Zealand Forest Service.

NOTE—(1) "Other Paper and Paperboard" excludes manufactures of paper and paperboard; values of "Other Paper and Paperboard" include minor items for which no quantities are given.

(2) Basis for valuation: imports, c.d.v.; exports, f.o.b.

(3) The figures for 1972 are for the June year.

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